American

FORESTS

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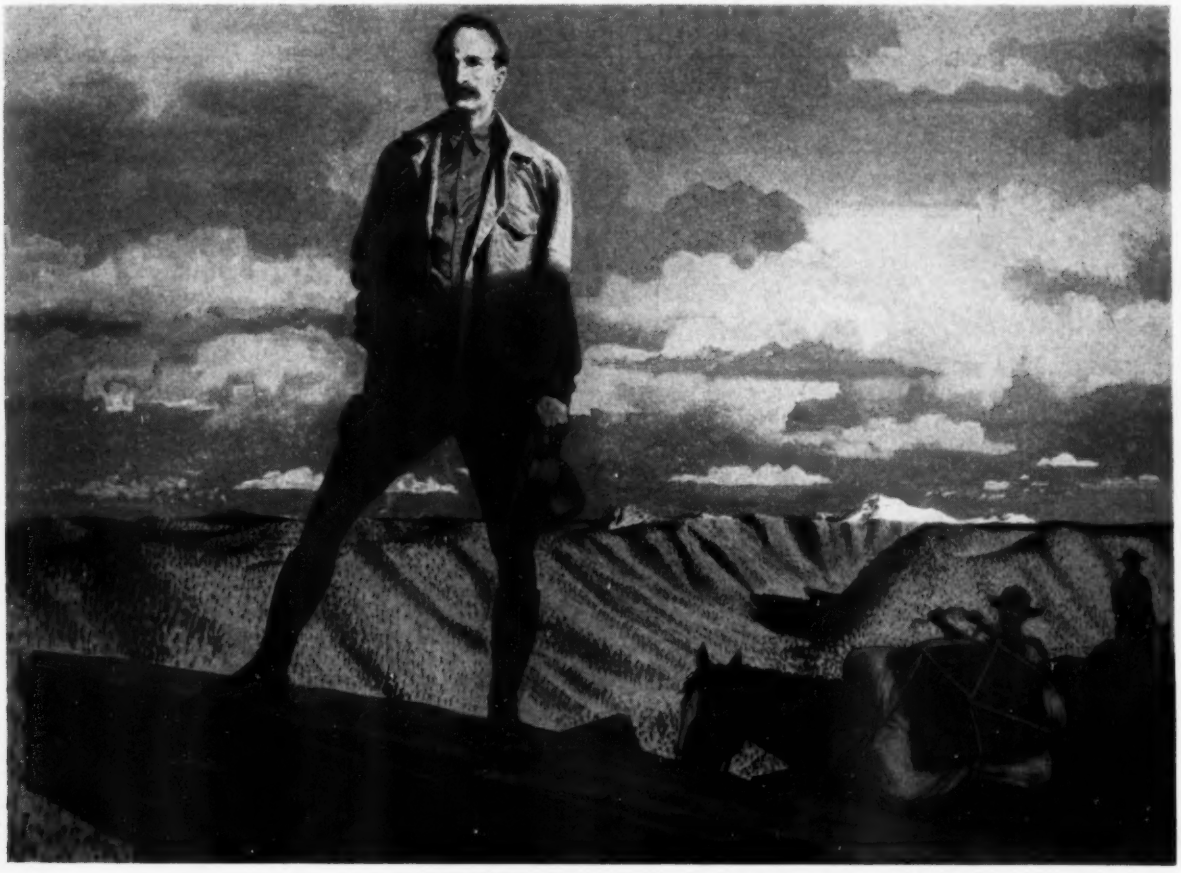

GIFFORD PINCHOT (1865-1946) — A leader in establishment of the U. S. Forest Service 50 years ago, serving as its first chief, 1905-1910. As America's first professional forester, Pinchot helped bring about national awakening to the wisdom of good timberland management. In 1900, he founded Yale School of Forestry

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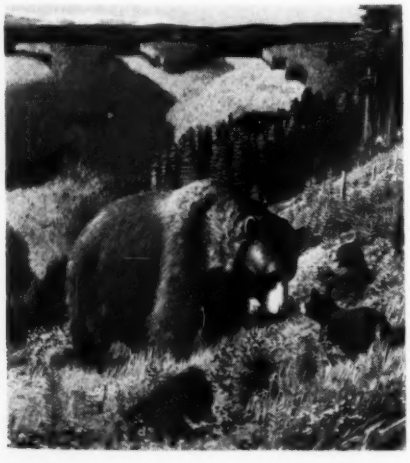
A permanent supply of wood is growing on tree farms. Below, Douglas fir is clear-cut in staggered patches and seed trees are left to reforest the harvested areas.



This year, the U. S. Forest Service celebrates its 50th anniversary. For a half-century, it has been guided by the policy laid down in 1905 by Gifford Pinchot, first chief of the service, and James Wilson, the Secretary of Agriculture. This policy begins: "All national forest land is to be devoted to its most productive use for the permanent good of the whole people..." The policy further provides that the Forest Service apply two basic principles in management of National Forest resources... that of *sustained yield* and *multiple land use.*

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Volume 61
No. 6
June, 1955

American FORESTS

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COVER • *Wissahickon Creek in Philadelphia's Fairmount Park. Photo by Harold M. Lambert.*

THE AFA

The American Forestry Association, publishers of AMERICAN FORESTS, is a national organization—independent and non-political in character—for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and their part in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

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Letters

Freer Trade—Pro and Con

EDITOR:

. . . You ought to have your head examined for publishing that article by Zellerbach in your April issue. Personally, I am less interested in Italian "solidarity" than I am in American solidarity. Speaking of medals, I move we strike one for the businessman who sensibly asked where people think we got the money that enables us to carry the rest of the world on our backs. . .

James J. Guinan
Buffalo, New York

EDITOR:

The more I read about the Crown-Zellerbach Company the better it sounds to me. I liked the reports on their forestry operations as carried in *American Forests* last year. Until last month I wasn't aware who J. D. Zellerbach was but I find myself in full agreement with everything he has to say about world trade. Our precious trade barriers, in my judgment, will prove of scant use to our industries if and when the bombs begin to drop.

John J. Coates
Pittsburgh, Pennsylvania

EDITOR:

. . . Its bad enough for an industry leader to get up on a platform and talk like this. But when a journal like *American Forests* publishes such nonsense there is cause for concern. I consider myself to be conservation-minded. But I am primarily interested in conserving what we have HERE, not what they have OVER THERE. . .

Robert Judson
St. Louis, Missouri

EDITOR:

. . . I am sure it must have taken courage for Mr. Zellerbach, a self-professed former protectionist, to make the statement he did. Regardless of the merits of his argument, I say if he can make our industry leaders—and all of us—think a little, he has accomplished no mean objective. . .

Peter Robinson
New York City, N. Y.

EDITOR:

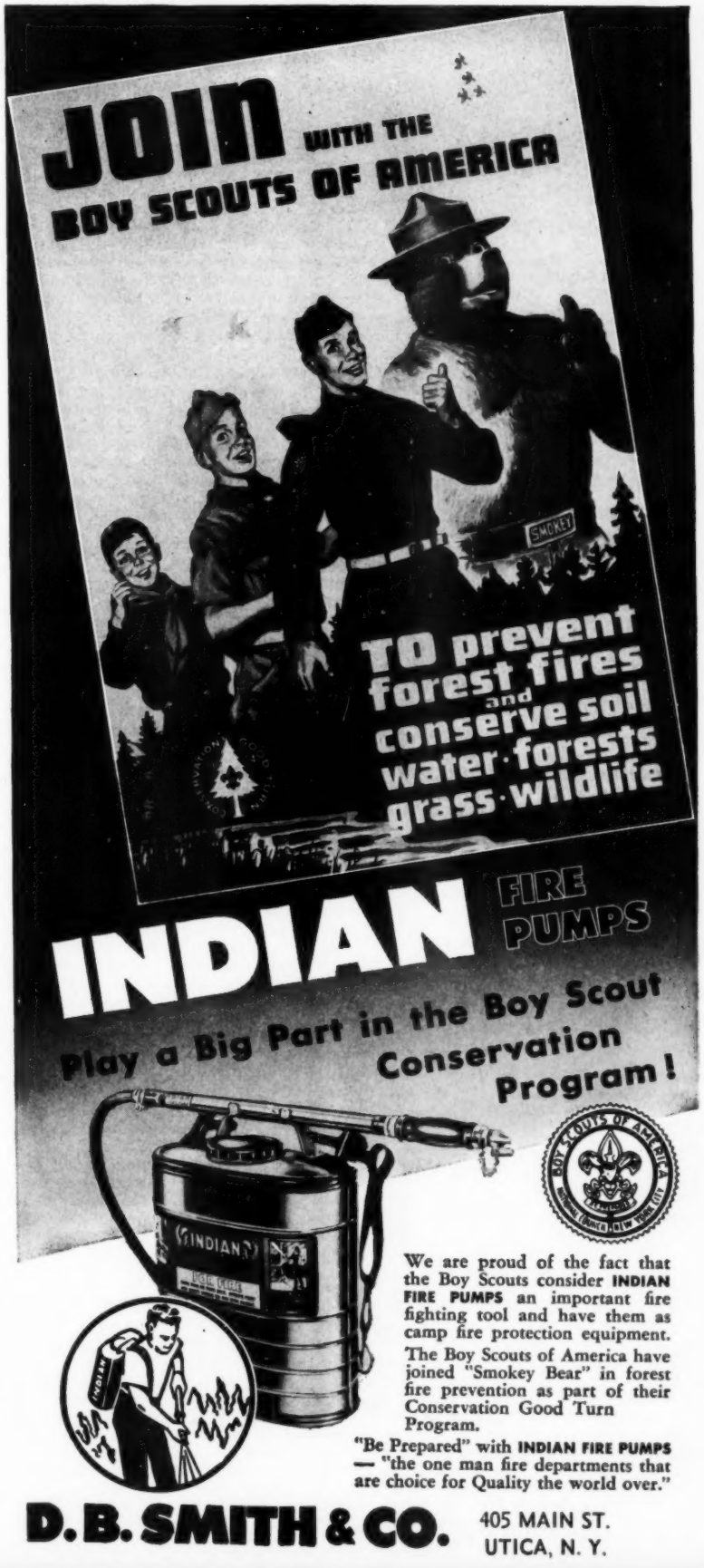
. . . Mr. Zellerbach is right. We have no other choice than the one he outlines. I for one am grateful to men like Randall and Zellerbach for the service they are rendering to their country. Faltering though it may be, here is the beginning of the global, one-world concept that must be developed in this nation if world civilization as we know it is to endure. One only prays that we may be granted the time to make the progress necessary. . .

J. N. Murphy
Boston, Massachusetts

EDITOR:

I have read Mr. Zellerbach's statement very carefully and others along this same general line including an editorial in a recent issue of *Life* magazine. One can't help but admire Mr. Eisenhower and others of his persuasion for their broad, humanitarian concepts. But can we be absolutely sure that our own highly-geared economy won't crash down if we follow Mr. Zellerbach's advice? Bad as it would be were Japan to go communistic, to have a crackup in our own economic system—the bulwark of the entire free world—would be even worse. It

(*Turn to page* 4)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Letters to the Editor

(*From page 3*)

is difficult for an average citizen to fully understand these things but one feels that great stakes are involved here. . .

Eugene L. Cooper
San Francisco, California

Conservation Chart

EDITOR:
Have just finished reading the April issue and my boys have had a lot of fun with the Conservation map enclosure. It's a funny thing but in 1948 in Korea I had an artist paint a large conservation map that was almost a duplicate of your enclosure. We used this painting to depict the value of forestry at a large Arbor day celebration and later the picture was hung in the auditorium of the Forestry Building at Chonju in Cholla Pukto Province.

Later when the U. S. Information Service opened an office in Chonju we made a large relief for an exhibit in their showroom which relief was copied from the painted map. . .

Nelson H. Fritz
415 Connell Avenue
Missoula, Montana

EDITOR:
I was able to create some interest in our local school system in the very unique conservation chart by Dr. Eschmeyer which accompanied the last issue of *American Forests*. Now I need a supply of these. . .

P. H. Glatfelter, III
President, P. H. Glatfelter Company
Spring Grove, Pennsylvania

EDITOR:
. . . Where can I get more of these?

Mrs. Thomas Oberlin
Boston, Massachusetts

EDITOR:
. . . The idea of having wildlife creatures to cut out was especially ingenius—helps to drive home the good policies recommended.

David E. Stalter
124 East 84th Street
New York 28, N. Y.

EDITOR:
. . . You've now put yourselves on the spot. How in Hades can you ever improve on that April issue?

Robert Sawyer
Bend, Oregon

EDITOR:
This is the type of thing which needs to be in every grade school in my city. Send me ten more copies.

Robert V. Kerley
1269 Pierce Street
Birmingham, Michigan

"Giveaway" Charge Challenged

EDITOR:
The shouting about "giveaway of natural resources" should be studied with a basis of fact.

The cry that greedy corporations are swindling the public has always been good political thunder, but here in the Northwest at this time there is fear the "giveaway" claim may bring about results unfavorable to the continued development of the area.

Many responsible publications have pointed out, editorially, the falseness of the "giveaway" claim, but the politicians have generally ignored the editorials and kept their assertions in the headlines, knowing headlines are more productive politically than editorials.

Factually, what the utility companies (public and private) are trying to do, is keep going the development of additional hydroelectric facilities, to meet the tremendous demands of the growing Northwest industrial area. It has been pointed out that Bonneville Dam and Grand Coulee were built with federal tax money at a time when the capital for those projects was not available otherwise. Furthermore, it has been pointed out time and again that Congress in 1951 under the Truman administration adopted the "no new starts" rule bearing on the expenditure of U. S. tax money for the construction of additional big dams in the Northwest, and that rule has, generally speaking, been continued as a matter of economy.

The continuation of water power development in the Northwest, and other areas, is certainly wise, and essential in the national interest, and in the absence of the government's ability to feasibly absorb the expense, public utility corporations and public utility districts, should be encouraged to do so; especially in view of the fact their rates and operations are under governmental control for the benefit of the users of electric power.

If our objective is to allocate the expense of all future hydroelectric development to the U. S. Treasury, that is something else. Otherwise what can justify U. S. taxpayers contributing over 400 million dollars to build the much publicized Hells Canyon high dam that would develop very little if any more power than the proposed development by the taxpaying Idaho Power Company, on the same stretch of the Snake River in Idaho, at a cost of less than 200 million?

If Senator Neuberger can block the Idaho Power Company development, and then thereafter is unable to convince eastern Congressmen, Democrats and Republicans, that U. S. taxpayers should continue to absorb the cost of continued water power development in the Northwest, notwithstanding the willingness and ability of the public utility corporations and PUD's to do the job, a stalemate may result, stopping or retarding the development. This could be a tragic byproduct of political demagoguery.

If present economic trends continue there will be more and more demand for low cost power, and the Northwest is one logical area for continued hydroelectric power development on a large scale. A stoppage of water power development in the northwestern states could mean a shifting of industrial growth to other areas not so favorable for such development, considering the overall interests of our economy. British Columbia has undeveloped water power in great abundance and though we enjoy observing the growth and prosperity of our neighbor North we also want to keep growing and prospering here.

H. L. Edmunds
2085 University Street
Eugene, Oregon

Challenge to Forestry

EDITOR:
Permit me to compliment *American Forests* for its forward looking editorial in the March issue entitled, "Accomplishments Yet to be Written on the Land."

It would have been desirable, however, if the editorial had elaborated somewhat on the statement, "only likely candidates for these posts, that is land managers, as of now are professional foresters provided they continue to show the necessary capacity for growth, imagination and ability to adjust to rapidly changing conditions." Foresters now are trained to become proficient managers of forest land for the production of wood, and governmental agencies employing such men, generally do not stipulate adequate or specific training in the other uses and services that the forests should render; so it will be necessary for the forestry schools to rebuild their curricula and for the public agencies administering forest lands to adjust their eligibility requirements if foresters are to manage multiple use forest lands effectively.

The achievement of the third goal in the AFA Program for American Forestry that is, "to obtain the maximum economic and social services from our forests by realistic application of the principles of multiple use in land management," will only be achieved either by vastly broadening the base of learning of foresters or by the training of specialists in Forest Land Use Planning.

On forest land in the ownership of individuals and corporations, whose major objective is the production of wood, the by-product concept probably will and should continue to prevail under which major emphasis is on the management of the forest lands for wood production and the other goods and services rendered by that land a by-product and incidental to the major objectives of ownership. On publicly owned forest land in a country dedicated to private enterprise, the true multiple use principle of management of publicly owned forest lands should prevail. It does not prevail today.

While your editorial did not prefix land management with the word "forest," I presume that you were referring primarily to forest lands. Certainly, you would not include agricultural and ranch lands as the responsibility of a forest land manager. Probably in the future, too, lands dedicated primarily for recreation whether they be desert, grass or forested lands will be managed by men with professional training markedly different from that now received by foresters.

Paul A. Herbert, Director
Division of Conservation
Michigan State College
East Lansing, Michigan

THE SENATE WENT ALL-OUT FOR FORESTRY IN VOTING APPROPRIATIONS for the Department of the Interior and related agencies for the fiscal year ending June 30, 1956. Under the reorganization of the Congressional appropriations committees, Forest Service items are included in the Interior bill, H.R. 5085. The House had voted $297,925,546 for the activities covered by the bill—a reduction from the budget request of $314,523,056. The Senate added $30,061,542 to the House-passed figure and voted a total of $327,987,088, thereby exceeding the budget requests by almost $13.5 million. Practically all of the increases proposed by The American Forestry Association were incorporated in the Senate proposals.

NO FORESTRY ITEM WAS CUT BY THE SENATE. Principal change in the forestry program of the Department of the Interior was an addition of $100,000 to enable the Bureau of Indian Affairs to step up its timber sales activities.

FOR THE FOREST SERVICE, THE SENATE MADE SUBSTANTIAL INCREASES. The funds for national forest management and protection were increased $4,700,000 above the $32,411,000 (budget request) voted by the House. The increase included $1,000,000 for timber sales administration; $200,000 for water resources management; $1,000,000 for sanitation and care of public campgrounds; $300,000 for maintenance of improvements such as towers, telephone lines, buildings; $625,000 for additional protection from forest fires in the national forests of California; $875,000 for reforestation and range revegetation; and $400,000 as a general service-wide allotment to take care of authorized pay increases.

ADDITIONAL FUNDS FOR FOREST PEST CONTROL, voted by the Senate, amount to $1,600,000—$1,170,000 requested in a supplemental budget that came in too late to be considered by the House, and $430,000 for white pine blister rust control on national forests.

FOREST RESEARCH WAS GRANTED A $500,000 increase by the Senate, bringing the total to $7,754,000. Increases include $300,000 for expanded research in the longleaf-slash pine belt of the South; $100,000 for forest, range and water management studies in the Blackhills area and adjacent territory in North and South Dakota and Wyoming; $40,000 for research on control of uneconomic water-loving vegetation in dry regions of the West; and $60,000 for research on fire protection and for general strengthening of the forest research program.

ACQUISITION OF LANDS FOR NATIONAL FORESTS, for which the budget asked nothing, and for which nothing was voted by the House, was granted $200,000 by the Senate. Of this, $190,000 is for scattered and unoccupied tracts within the boundaries of the national forests, with $150,000 of the total being specifically recommended for purchase of lands within the Chippewa National Forest, Minnesota—lands owned by the Chippewa Indians. The other $10,000 is an authorization to use national forest receipts to purchase watershed lands within the Cache National Forest, Utah.

ALTHOUGH THE ADMINISTRATION HAS TRIED TO PLACE MORE OF THE FIRE CONTROL BURDEN of state and private lands in the hands of the states, it appears that the Congress will not go along. The budget request for cooperative forest fire control was for $8,365,810. The House raised this figure to $9,449,500, thus continuing the same appropriation as was voted for the previous fiscal year. The Senate added another $2,000,000, bringing the total for this activity to $11,449,500—the largest amount ever allotted for the program.

(Turn to next page)

FOR COOPERATION WITH THE STATES IN TREE PLANTING, FOREST MANAGEMENT ASSISTANCE and processing assistance to private landowners and timber operators, the Senate added another $300,000 above the House-passed budget request. Last year, the Administration asked that the management and processing assistance program be eliminated, but the program was continued by the Congress. This year, the Administration asked only that the program continue at its usual level. An attempt in the House to add $400,000 was defeated; but $300,000 was added in the Senate.

THE NATIONAL ARBORETUM, LOCATED IN WASHINGTON, D.C., and seldom seen by the public because it is without facilities to take care of the crowds that might be attracted to it, was voted $150,000 by the Senate to begin a program of road construction. Total program is estimated at around $300,000, half of which is recommended this year.

AS AMERICAN FORESTS GOES TO PRESS, Senate and House conferees are attempting to work out the differences between the two versions of this appropriations bill. While it is possible that all the Senate additions will be sustained, it is more likely that some compromise between the Senate and House figures will finally be enacted. At any rate, the forestry programs of the federal government for the fiscal year ending June 30, 1956, will be financed considerably beyond the requests of the Administration.

SUPPLEMENTAL APPROPRIATIONS FOR THE CURRENT FISCAL YEAR as enacted in Public Law 24, include $3,500,000 for forest highways; $875,000 for public lands highways; $350,000 for fire suppression, Bureau of Land Management; and $2,750,000 for control of spruce budworm in Oregon, Idaho, Montana, and New Mexico.

TERMINATION OF FEDERAL SUPERVISION OVER THE LIVES AND PROPERTY OF THE INDIANS, a program which began last year when several bills were passed affecting individual tribes and bands, is a more difficult task than was originally imagined. For example, Public Law 399 of the 83rd Congress calls for the elimination of federal jurisdiction over the Menominees by December 31, 1958. Now, Representative Laird of Wisconsin has introduced a bill to extend the termination date to December 31, 1960.

REFORESTATION OF FEDERAL AND NON-FEDERAL LANDS under a federal program is proposed by Senator Aiken of Vermont. His bill, S. 1876, provides that the federal government assist the states in planting and with technical assistance in the development of reforestation programs. Financial participation of the federal government is to be on a 50-50 sharing basis with the states. No specific sums are to be authorized under the present version of the bill.

A NATIONAL WATER POLICY RECOGNIZING FEDERAL RESPONSIBILITY FOR GUIDANCE, but also recognizing the rights and responsibilities of the states and private individuals, has been proposed by Senator Martin of Pennsylvania. The bill, S. 1857, is similar to measures introduced in past Congresses. It is believed, however, that action on water policies will await the reports of the President's Water Policy Committee and of the Commission on Intergovernmental Relations.

A MISSOURI BASIN RESOURCES DEVELOPMENT COMPACT, among the states of Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming, is proposed by Representative Thompson of Wyoming, in H.R. 5824. The bill seeks Congressional consent for the states to engage jointly in a comprehensive program for unified planning, development and operation of the land and water resources of the Missouri Basin. The bill is similar to that earlier introduced by Representative Hope of Kansas.

FOREST SERVICE TIMBER SALES ACTIVITIES have been examined by a firm of private management consultants. In a 100-page report, McKinsey and Company indicates that Forest Service timber sales policies are generally well conceived, but are not uniformly well applied. The report states a need for better understanding of the importance of timber sales, a definition of priority of sales work as related to other Forest Service activities, and greater cooperation among the service personnel and the industries dependent upon national forest timber. The report is being studied, by the Forest Service, but will not necessarily change existing policies.

EDITORIAL

The Shot Heard 'round the South

When arsonists caught in the act of setting fire to a Louisiana forest shot at a State Forestry Commission investigator and the investigator fired back it was literally a gun fight heard around the state for it gave a fighting state forester by the name of James E. Mixon the sounding board he needed in declaring war on all those who jeopardize life, property, and the economic future by deliberately setting fire to woodlands. News of the episode received wide circulation in the South. In a year when southern states have suffered calamitous forest fires it was noted that Mixon's foresters have more than held their own with the arsonists in holding down losses and in even carrying the battle to the enemy.

Needless to say, State Forester Mixon has been travelling a rocky road in pressing his enforcement program. Most of his problems are centered in the state's 360,000-acre Livingston parish where choice pines produce 5,000 feet per acre. It is here that arsonists are running amuck. Their reasons for such sadistic activity are difficult to fathom but in general they seem to boil down to resentment of any form of law and order as practiced by State Forester Mixon and resentment against larger ownerships under sound forest management. To combat upwards of 1,000 "sets" Mixon poured 22 fire crews into this one parish where fires were held to an average eight acres per fire. At the same time the state forester put on more fire investigators who have given him 100 convictions thus far.

As is the case in many southern states, however, the enforcement pattern in Louisiana breaks down on the question of penalties. Sentences meted out were in piddling fines for the most part although Mixon's men did succeed in sending one offender to jail for 30 days. Just the same, there are signs that the public may be swinging behind Mixon's banner. When Investigator V. E. Smith returned the fire of the arsonists and routed them the state forester's answer to this challenge to law and order was "more investigators." When two more investigators were charged with "kidnapping" a man arrested for setting a fire, Mixon called the charges "the signs of desperation by arsonists who feel the pressure is getting too great." Even more encouraging has been the recent action of a Louisiana grand jury in bringing a true bill, for the first time, against a man charged with timber arson. If convicted, the defendant stands to receive a maximum sentence of six months in jail and a fine of $2,000. Not too severe in view of the nature of the felony one might say, but it would represent a start. And in Mixon's judgment a few object lessons in the form of jail sentences will accomplish more than anything else in curbing these practices.

Mixon's views are substantiated by enforcement results obtained on southern national forests starting back in 1932. When the Forest Service first brought arsonists before federal courts, judges frequently dismissed the cases stating that lots of people burned over land for one reason or another. The answer of the Service to this threat to growing timber and watershed values was an educational program aimed at court officials. Convictions soon started to pick up. Some sentences were measured out in terms of years, not months. Once the book had been thrown at a few arsonists "sets" on national forests dwindled. The word soon got around that "Those feds are tough; leave their lands alone."

Until arsonists start saying the same thing about the state foresters the South's fire burden will continue abnormal. Only one thing stands between the South and epic achievement in cooperative forestry. That one thing is fire. The stakes are great and in this past drought year fires that seemed to come in bunches gained the ascendency in too many cases. Even as weary crews fought these holocausts the story was told of arsonists who started a diversionary fire to draw in fire crews and obscure the vision of firetowers and then proceeded to touch off 60 different "sets" in one area. Alleged purpose of this particular maneuver was to roust game out of an area that was protected into one that wasn't.

There can only be one answer to these practices. That is more men of Mixon's stamp backed by an aroused press, clergy, and, most of all, the courts who are not hesitant to thunder out and take action against a form of anarchy that is a menace to life and property. Clinics to beef up fire fighting methods are fine. So are the educational efforts in prevention. More of both are needed. At the same time a real effort should be made to clamp down on the arsonist. A good place to start would be at AFA's convention in Florida this fall with southern governors invited to consider the problem with the view of presenting a united front against a form of lawlessness that threatens one of the South's great economic props for the future—its forests.

Assaying the nation's timber wealth is a gigantic and ever-continuing task, for the findings of this study form the basis of forestry programs of the future

Progress on the Forest Survey

By H. R. JOSEPHSON

IN January 1930 field parties of the Pacific Northwest Forest Experiment Station entered the woods of Washington County, Oregon to launch the nationwide Forest Survey. After many years of arguments over the issues of timber famine and the need for conservation programs, Congress in 1928 had finally provided for a national survey of forest resources as part of the McSweeney-McNary Forest Research Act. This basic Survey aimed to provide facts, rather than conjecture, regarding availability of timber supplies and actual rates of timber depletion and growth.

With an initial appropriation of $40,000 the work of drawing up regional plans and specifications for timber inventories began in the Portland Office of the Forest Service under the leadership of H. J. Andrews and Bob Cowlin. Soon thereafter other survey organizations were at work in the Lake States under the supervision of R. N. Cunningham, in the Northern Rocky Mountains under Melvin Bradner, and in the South under Gar Lentz and "Cap" Eldridge.

By Pearl Harbor Day, some 12 years later, 304 million acres of forest land—or nearly half of the country's forest area—had been covered. With the outbreak of World War II the Survey was practically suspended until 1946 when work was resumed. This was aimed at completing initial coverage of unsurveyed areas as

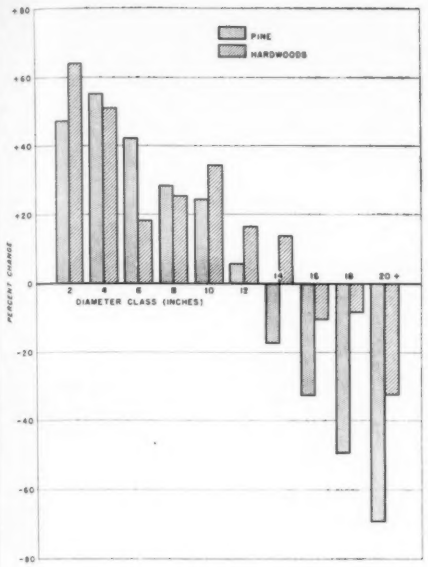
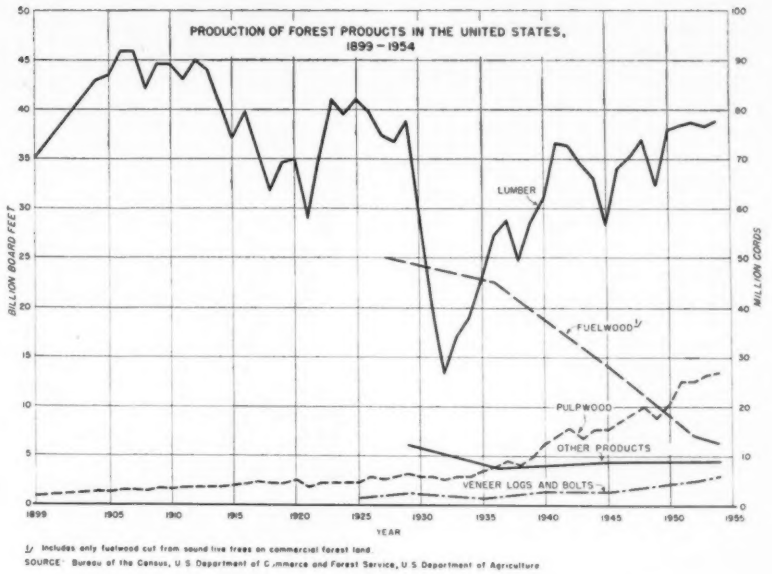


Chart shows change in the number of trees in Georgia between 1935 and 1952



Forest products production has had its share of "ups and downs"

rapidly as possible, and in addition, resurveying the areas where heavy cutting and other factors had materially changed the forest situation since the depression years of the 1930's.

A reasonably typical illustration of Survey history and findings may be found in the work that has been done in Georgia. In 1934-36 field parties from the Southern Forest Experiment Station made the first inventory of forest lands in this state. Rather surprisingly, results showed that despite repeated fires and clear cutting practices young timber was growing on a large part of the cut-over forest area and forestry opportunities were promising.

During World War II and the postwar years conditions in the South changed with startling speed. Production of lumber in Georgia nearly tripled, rising from 0.9 billion board feet in 1935 to 2.4 billion feet in 1952. The cut of pulpwood expanded from a few thousand cords in 1935 to 2.9 million cords in 1953. Offsetting this greater industrial use of timber during this period, fire protection and other forestry programs also were increasingly affecting the forest situation. To appraise the effect of these varied developments on timber supplies, Forest Survey crews in cooperation with state groups in 1950-53 once again inventoried Georgia's forests.

What happened to the forests of Georgia during these eventful 18 years between surveys? First, the resurvey showed that forest acreage had increased by 2.6 million acres—a gain of 12 percent. Two out of three acres in Georgia are now forest land.

This trend toward conversion of croplands to forest, at a rate far in excess of localized land clearing, has been a general one throughout the South. In seven southern states resurveyed since 1946 forest areas have increased by an average of four percent. In some localities forest areas have decreased, notably in the Mississippi Delta where they dropped 12 percent. In upland areas forests have consistently gained ground since the mid-thirties, for example, by as much as 18 percent in southeast Alabama.

A second trend evident in Georgia, as well as in most other eastern states, has been a steady conversion of pine forest types to hardwood types of lower quality and value. Only 22 percent of the forests of Georgia were in hardwood types in 1935, compared with 34 percent in 1952. And cutting practices which remove the preferred softwoods and favor hardwoods are still converting additional pine areas to hardwood stands. These trends in species composition emphasize the growing seriousness of the "hardwood problem" to both the lumber and the pulp industries.

The "structure" of timber stands in Georgia, as in other parts of the South, also has changed materially in the years between surveys. Present stands contain more small trees and fewer large trees. Numbers of pine trees under 12 inches in diameter increased by 40 percent, while hardwoods increased by 54 percent. At the same time, heavy cutting of the older timber reduced the number of the larger trees above 12 inches in diameter—by 32 percent for pine and by five percent for hardwoods. One-fourth of Georgia's forests are still poorly stocked, but this rising inventory of small trees indicates a large potential improvement in timber supplies—provided fire protec-

Aerial photo interpretation technique has been used successfully in survey

tion and other forestry programs are continued and strengthened.

The cubic volume of all trees in Georgia above 5.0 inches in diameter dropped about 1 percent between surveys. This is a somewhat more promising situation than prevails in most parts of the South, where on the average softwood volumes decreased about six percent, while hardwoods increased about four percent. Changes in softwood cubic volumes have ranged from a drop of 49 percent in northern Mississippi to a gain of 30 percent in southwest Alabama.

Today in Georgia net growth of timber averages about one-half cord per acre, including 0.36 cords of pine and 0.17 cords of hardwood. Growth of pine is slightly in excess of the cut. But growth of hardwoods is 58 percent greater than the cut. Although growth is now about double the average of 0.3 cord per acre that prevailed during the mid-1930's, it still falls far short of what is possible with good forest management.

Because of heavy cutting of the larger trees, the volume of "sawtimber" in Georgia's forests dropped by 5.7 billion board feet between surveys. This was a decline of 15 percent for pine and 11 percent for hardwoods. By 1952, however, this downward trend in volume had been halted, at least temporarily. Growth of pine sawtimber slightly exceeded the cut in 1952, while growth of hardwood sawtimber was significantly in excess of the cut.

Along with the decline in the volume of sawtimber has been a disturbing drop in size and quality. In Georgia only 24 percent of the volume of merchantable hardwood trees, for example, is in the better grade logs. Cull trees doubled in volume during the 18 years between surveys, and now comprise nearly one-fourth of the total cubic volume of all standing timber.

To the pulpwood industry in the South the increase in numbers of small trees and the rise in cubic-foot growth represents a generally promising situation. The lumber industry, on the other hand, for the immediate future at least, is faced generally with problems of shortages in both quantity and quality of sawtimber.

A summary of Forest Survey findings for recently surveyed states shows wide variations from area to area throughout the country. In some states the Survey shows serious declines in timber volumes; in other areas the Survey is finding considerably more timber than indicated by prior "estimates."

Logging on Gifford Pinchot National Forest. Survey keeps Forest Service informed of amount of merchantable timber on its lands

In the East, where the greater part of the nation's timber growing potential is located, surveys show such major resource problems as a continuing decline in the supply of softwood sawtimber in the face of expanding requirements for these preferred species. Hardwoods are in surplus supply, on the other hand, largely because of low quality and limited markets. Excessive numbers of cull trees take up much growing space. Understocking of forest land with desirable species is still widespread. At the same time the effects of recently expanded forestry programs are becoming increasingly evident. Many stands are "thickening up" with small trees as the result of fire protection. Quality is being raised to some extent by stand-improvement measures. Utilization of logging and mill residues is more and more common.

In the West, old-growth timber resources are being heavily tapped to supply lumber and other products for national markets, and mortality still offsets much of the current growth of timber. Although the western cut must be reduced ultimately, fire protection and other forestry programs are helping to maintain a base for future forest industries.

Forestry programs are being steadily expanded throughout the United States, but it is important to know if progress is rapid enough to raise timber growth sufficiently to supply prospective requirements for forest products. This can be determined only by periodic stock-taking of the nation's forest situation, such as the 1945 Reappraisals made by the Forest Service and The American Forestry Association, and the current Timber Resource Review. The Forest Survey provides the foundation for such necessary evaluations of forestry progress and opportunities.

Survey Information Widely Used

Just how are Survey statistics and other resource information utilized? To forest industries, timber resource facts are as essential as many other business statistics relating to production and markets. Just as the need for basic operating statistics is taken for granted in the fields of agriculture and industry general, so is the need for up-to-date information on the growth and use of timber resources increasingly recognized. Timber industries need detailed resource data for all important business planning—for mill location, wood procurement, tree planting, or long-term management of company timber lands.

The spectacular expansion of the southern pulp and paper industry which began in the 1930's was based in considerable degree on the facts provided by the Forest Survey. Further large expansion of mill capacity is in prospect and this, as well as other sound business planning of forest industries, will continue to require accurate and up-to-date forest resource facts.

To public forestry agencies, knowledge of forest conditions and trends in timber supplies and demands is an essential basis for all important for-

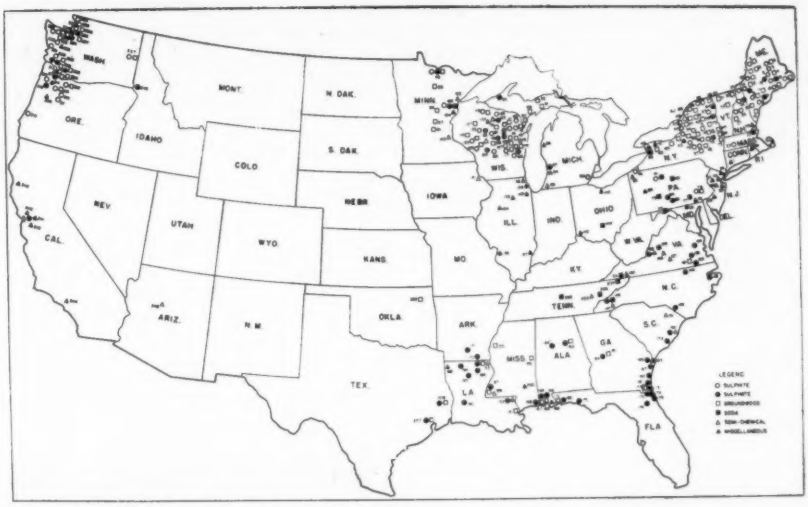
estry programs. The success of fire protection programs, tree planting, timber stand improvement, and other forestry measures aimed at balancing the nation's timber budget can be determined only by periodic forest surveys. And it is evident that the need for expansion or changes in these forestry programs must be judged in the light of current and prospective trends in forest conditions.

Information on resources provided by the Forest Survey constitutes an essential basis for Congressional action and for programs of Federal forestry agencies. The Survey provides a guide to state legislatures and conservation departments, forest landowners, and other agencies or individuals concerned with local problems of land management and industrial development. Railroads and local Chambers of Commerce use Forest Survey facts for planning future programs and for encouragement of local wood-using industries. Expectations of timber owners as to future markets and prices depend basically upon information on timber supplies and prospective demands, such as provided by the Survey. Even the farmer in the corn belt of Iowa has a stake in the Forest Survey of the distant regions which supply him with lumber, paper, and other forest commodities. Much of the substantial cooperation contributed locally to the Survey reflects this variety of local uses for timber resource facts.

Forest Survey findings are made available to the public in statistical and analytical reports for states or groups of counties, in maps showing forest types and stand condition classes, and in a wide variety of special reports and correspondence. In California alone, for example, more than 18,000 timber maps, compiled by the Survey in cooperation with the State Division of Forestry, were sold to various purchasers. In an average year the Survey supplies timber resource facts in answer to literally thousands of requests for information from lumber and pulp companies, landowners, various branches of local, state, and federal governments, railroads, timber consultants, bankers, insurance companies, conservation organizations, forest schools, and the general public.

Survey Authorizations Broad in Scope

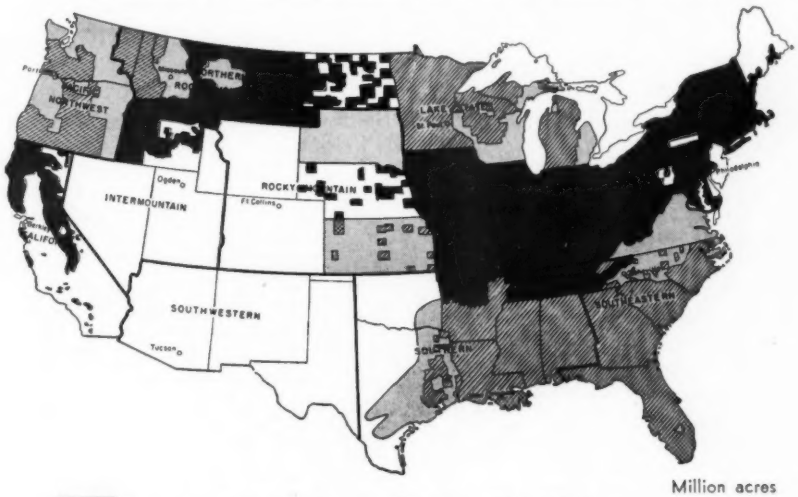
The original legislation for the Forest Survey contained in Section 9



Wood pulp mills in the United States by state and type of product

Every type of timber stand, from good to poor, comes under survey

Area covered by nation-wide forest survey as of December 31, 1954



		Million acres
	Forest land initially inventoried In F.Y. 1930-46	305
	" " " " In F.Y. 1947-55	168
	Total	472
	Forest land remaining to be initially inventoried	154
	Forest land reinventoried F.Y. 1947-54	206

of the McSweeney-McNary Forest Research Act of 1928 authorized and directed the Secretary of Agriculture, in cooperation with state or private agencies, to make and keep current:

> . . . a comprehensive survey of the present and prospective requirements for timber and other forest products in the United States, and of timber supplies, including a determination of the present and potential productivity of forest land therein, and of such other facts as may be necessary in the determination of ways and means to balance the timber budget of the U. S.

The Forest Survey provides the only comprehensive source of facts on: (1) the area, condition, and productivity of forest land, (2) the volume, species, quality and location of standing timber, (3) the ownership of forest land and timber, (4) rates of timber growth and mortality from natural causes, (5) the cut of timber for lumber and other forest products, (6) present consumption and prospective requirements for various timber products and standing timber, and (7) related information essential to an adequate appraisal of the nation's timber resources.

In 1944 and 1949 the basic Survey legislation was amended to provide for resurveys of areas previously covered in order to keep Survey information current. This action recognized that the level of timber cutting, the technology of wood use, timber markets, and other economic conditions are continuously changing, and that resurveys must be made periodically to provide government and industry with up-to-date facts on changing timber resources.

The 1949 amendment increased the authorization for initial surveys to $1,000,000 annually in order to permit early completion of a first timber inventory. In addition this legislation authorized $1,500,000 annually for a long-term program to keep the Survey current. In recent years total Survey appropriations have averaged approximately $816,000 annually, and have thus fallen far short of the amount authorized.

Present Status of the Forest Survey

Between 1930 and the outbreak of World War II, the Survey covered 304 million acres of forest land, chiefly in the important timber growing regions of the Pacific Northwest, Northern Rocky Mountains, the South and Lake States. Between 1946, when the Survey was resumed after the interruption of World War II, and January 1, 1955 an additional 375 million acres of forest land was surveyed; this included 169 million acres covered for the first time and 206 million acres covered by resurvey.

During recent years the Survey has covered an average of about 44 million acres annually, including both "commercial" and intermingled or adjacent "noncommercial" forest lands. Total costs of the Survey during the postwar years have averaged about 1.7 cents per acre of federal funds, plus an average of 0.7 cents per acre of state and local cooperative contributions.

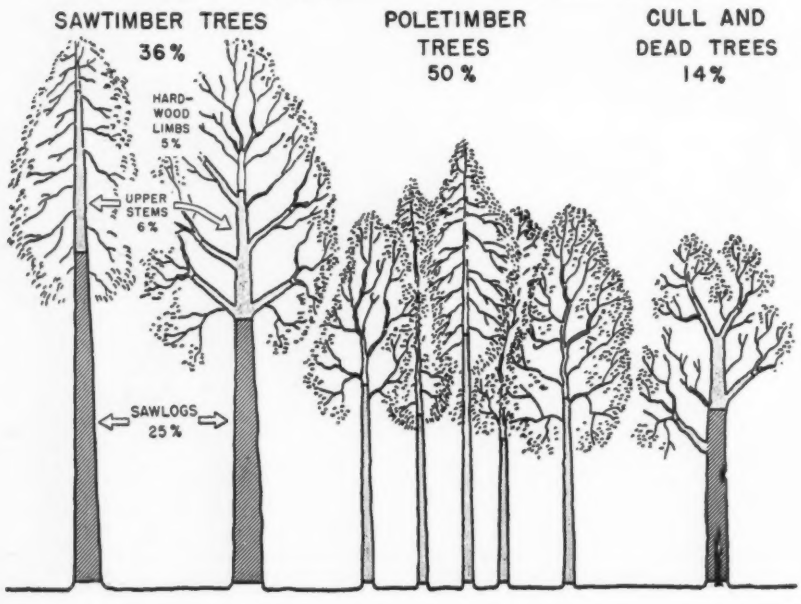
The initial surveys made since 1946—chiefly in the Northwest, Central States, California and the Rocky Mountains—raise the total area covered by initial surveys to 473 million acres. This represents about 76 percent of the total forest area in the continental United States, and 91 percent of the more important commercial forest lands.

Approximately 153 million acres remain to be covered for the first time, chiefly in the Rocky Mountains and the Northeast, including about 40 million acres of commercial forest lands. In southeastern Alaska also, Survey work has been started to provide a basis for the rapid expansion of forest industry under way in that territory. Approximately 20 million acres of forest land in this area need to be surveyed currently. Ultimately there will be need for information on the productive classes of forest lands in the Alaskan interior.

The resurveys made since 1946 amount to 206 million acres of forest land. This represents about 70 percent of the forest areas first surveyed during the 1930's.

Studies of the consumption of lumber and other forest products have been made for the more important uses of timber, including lumber used in residential and farm construction, lumber used for fabricated products, wood used for pulp and paper, and trends in use of plywood and veneer. These consumption studies provide a basis for estimating potential demands for timber under prospective future conditions. In conjunction with the facts on timber supply they help provide a basis for setting growth goals which will serve as one guide for the nation's forestry programs.

Proportions of all timber on commercial forest lands in Minnesota, by class of material, 1953 (in percent of total sound cubic foot volume)



Large Cooperative Contributions from States and Industry

Cooperation with state and local sources has played an important role since the beginning of the Forest Survey. Cooperative contributions have permitted faster survey coverage, and in many areas more intensive surveys than would otherwise have been possible.

Originally, the Survey was oriented in large measure toward supplying national and regional information on timber resources and needs. Many local uses for forest resource facts soon developed, however, to guide state agencies, forest indus-

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The mangroves sprawl along the shores of many low tropical coasts, extending their roots like the legs of great, crouching spiders

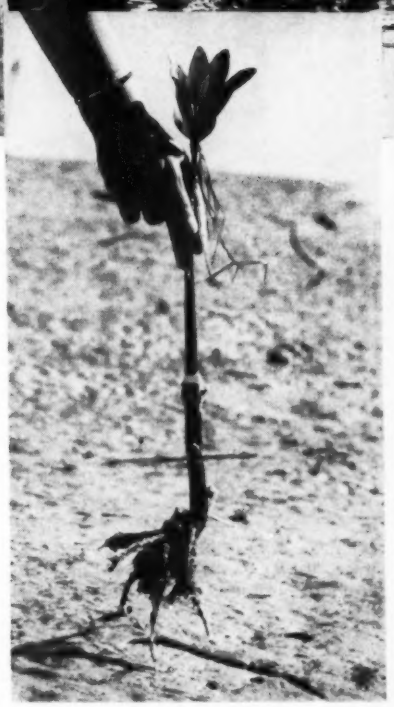
THE TREE THAT WALKS

By ROSS E. HUTCHINS

THERE are two types of living things that have brought about major changes in the outlines of the world's islands and continents merely by their living and growing processes. The first of these are the tiny coral animals that, by the united effort of their teeming billions, have built up reefs along the shores of many lands that are bathed by warm seas. They have created atolls in the midst of lonely oceans, each one complete with circular, fringing reef and tiny, green islands like emerald beads on a necklace. Each reef is an ecological microcosm vibrant with life in amazing abundance and diversity.

The other living things that have had a hand in the shaping of land masses are the mangroves. The mangroves are trees or shrubs that sprawl along the shores of many low tropical coasts, extending their roots like the legs of great spiders crouching by the sea, ever reaching outward. Behind this slowing advancing wall of vegetation is a tangled mass of stems, arched prop-roots and trunks that almost defies human penetration. Such is the mangrove swamp that surrounds southern Florida, especially on the western side, and which clothes the shores and islands on the great Amazon delta, as well as the margins of many other tropic lands.

Within the impenetrable tangle of vegetation there lives a special world of animal life. Here live the snowy egrets and the alligator as well as small birds of many kinds, particularly in the vast mangrove swamps of tropical America. Beneath the water, attached to the sprawling roots are oysters that have often caused them to be called "oyster trees."



But the mangroves, like the coral animals, are almost cosmopolitan in distribution. They grow, not only about coasts, but at the mouths of jungle streams and follow the muddy margins for considerable distances from the sea, even encroaching at times upon the land. Too, they are features of the coasts of Melanesia

(*Turn to page* 60)

Picture above and photos on opposite page are of land that would be inundated by proposed lock and dam project

Battle of

The community of Jackson, Alabama is up in arms over a proposed lock and dam project that would flood the Tombigbee River bottoms

THE quiet little community of Jackson, Alabama, became a seething scene of activity early on the morning of February 10, 1955. Traffic converged on the town from all points of the compass. Eating places were jammed soon after dawn, and the extra waitresses recruited for the day were hard pressed to deliver the hurried breakfasts—or even to hear the orders over the excited voices of the folks from "up country" who wanted to be at the community house early enough to get seats within earshot and view of one of the most vital public occasions of their lives.

They were there in an attempt to save their land! The Army Corps of Engineers had called a hearing on the proposed Jackson Lock and Dam Project.

The tourist on his way through Alabama, to Mobile and toward the Gulf Coast, sees vast areas of pine. At bridges that reach across such rivers as the Tombigbee, he catches a fleeting glimpse of swampy bottomland with tangles of hardwood timber. Swamp land! A haven for mosquitoes, snakes and doubtless innumerable alligators!

This is some of the more valuable land in the state, none of it is for sale; it supports fast-growing stands of oak, gum, cypress and related species which in turn support an important segment of the lumber industry and its dependent workers and communities. Deer and wild turkey, which find little food in the upland pine stands, thrive in the hardwood bottoms.

The Tombigbee River bottoms are especially productive because the river which rises in northeastern Mississippi, flowing southeasterly to join with the Alabama to form the Mobile River, brings with it the eroded fertility of the fabulous Black Belt. A rapid stream in high water, it is sluggish when the water is low. Each year, it overflows its banks, and the adjacent bottomlands stand deep in silt-laden water which recedes before the growing season starts. For centuries this annual flooding has taken place, and each year the soil is moistened and enriched. The trees which populate the Tombigbee bottoms are those adapted to periodic flooding, and the farming practices of the bottomland farmers likewise have been adapted to take advantage of the soil and moisture conditions.

The contours of the land north of Jackson show very little rise. Consequently the river covers a wide area at flood tide. However, when one ascends just a few feet above the high water level, he enters a fringe of lower-grade hardwood timber—hardwoods which are trying to invade the pinelands — and then for mile after mile he sees only pine, the tree better adapted to the drier less fertile soil.

Depending upon its location within the Tombigbee bottom, and upon the cutting practices in the recent past, this land is producing from 240 to 1000 board feet per acre per year; it has been estimated by foresters to be capable of producing an average of 500 board feet annually. Average stumpage price now being paid by timber operators is $36.50 per thousand board feet, which means that the bottomland acres are producing from $11 to $36 annually, with an average potential in excess

of eighteen dollars to the acre.

Even if the landowner were able to invest his money in a security paying as high as 6 percent annual interest he would need to have $300 for each bottomland acre, on the average, and over $600 an acre for the best in order to realize comparable income.

These bottomlands are the mainstay of a local hardwood lumber industry that has over $9,000,000 invested in plant and equipment; that employs directly some 1500 men with over 6000 dependents. Contract and independent loggers swell the number of families that derive their livelihood from the river bottoms; their investment in equipment and facilities amounts to almost $3,000,000.

The Tombigbee River is also an important link in a water navigation program designed to provide cheap transportation to the mining and industrial centers of the Birmingham area. The Warrior River flows from the Birmingham area to join the Tombigbee at Demopolis, some 120 miles north of Jackson. The river project authorized for the Warrior-Tombigbee provides for a navigable channel nine feet deep and 200 feet wide where practicable. An improvement and modernization plan for the stream from Mobile to the headwaters has been completed on the Warrior, above Demopolis. Structures in the Tombigbee between Jackson and Demopolis consist of three locks and dams with a total lift of 31.7 feet above mean sea level. One of the lock and dam combinations was completed in 1909; the other two in 1915. By modern standards these are considered obsolete. However, barges now ply the river bringing foreign ores and petroleum products and other materials from Mobile Bay to the manufacturing and mining centers in the Birmingham area, some 400 miles away. Downstream they transport manufactured iron and steel products, coal, logs and pulpwood.

Purpose of the proposed project between Jackson and Demopolis as explained by the Warrior-Tombigbee Development Association is: "To improve navigation conditions for 100 miles by providing greater depth and width of channel and to improve lockage conditions by replacing three small, obsolete locks with a single 110-foot-by-600-foot lock, thereby permitting large tows to lock through in a single lockage where multiple lockages are now required at each existing lock. Shallow pools created by existing dams slow navigation on the river because of the restricted channel width and because of bottom suction on towboats and barges."

This statement was elaborated upon at the hearing by persons and organizations which stand to benefit by the expenditure of an estimated $28,000,000 by the Army Corps of Engineers. Supplementary benefits, such as improved recreation and the possibility of commercial development to serve it, attraction of new industries, etc., were added to the picture. All in all, the scene developing in the minds of the proponents was rosy, and one which at first glance at least appeared to promise everything at no cost to the local people.

Under the authorizing statutes, however, the Corps of Engineers must develop for each such project what is known as a benefit-cost ratio. Unless benefits to be derived from a project are at least equal to the cost, the project cannot be approved. Preliminary studies of the proposed high dam at Jackson showed a favorable benefit-cost ratio, but damage to the local economy was not considered as a cost factor. Some $2,000,000 was allowed for acquisition of land and easements, and this carried at interest over the life of the proposed structure was the total of

the Bottomlands

By ALBERT G. HALL

what might be considered local damages. Total land involved in fee purchase and easements amounts to 68,810 acres.

Questions raised as to the effect of the proposal on the local economy, between Jackson and Choctaw-Marengo - Sumpter county line prompted the Corps to hold the public hearing before proceeding further with its studies.

The Warrior-Tombigbee Development Association which has been promoting the project represents the industries and communities that would be directly benefited by the proposed development. On the other hand, the Tombigbee-Alabama Valley Protective Association represents those whose interest lies primarily in protecting the valley resources and the dependent industries, communities and landowners from the adverse effects. More simply stated: one group is composed of those who believe they stand to benefit by the project; the other is the group that would pay the price.

It is the latter group, the protective association, whose story is emphasized here, since it shows how diverse individuals will join in concerted effort when faced with economic destruction. This group seeks no new benefits, they are not interested in subsidized transportation, they do not seek to sell their land at a high price. They wish only to be let alone, to hold and develop the resources of their area, to operate industries and businesses that they have developed, and to enjoy and perpetuate the recreation and wildlife that is now part of the native scene. They seek to protect themselves from the adverse effects of the ruthless march of what is often called "progress."

Organized under the leadership of Lee Robinson, prominent lumberman and civic leader, the Association consists of landowners, members of forest products industries, representatives of wildlife interests, and business and civic groups of the area. That this group of diverse interests, each ordinarily concerned only with its own particular line of endeavor, and often mutually competitive, were galvanized into a realization of their mutual dependency is a tribute to the officers of the Association and to Charles D. Kelley, its secretary. Mr. Kelley was loaned to the group by the Alabama Wildlife Federation of which he is executive secretary.

With a small group of volunteer assistants, Kelley visited the people and communities, and as he told them how the proposed dam might affect them and their livelihood, the number of participants snowballed from few to hundreds. Few of the affected landowners knew, for example, the difference between easements and fee simple sale of their property. Very few understood that under present policies of land use by the Corps of Engineers easements were to be taken on land that would be permanently flooded. Even fewer believed at first that anything could be gained by trying to fight the proposal. The land is in a large number of small ownerships. There are no large industrial holdings within the affected territory. Total ownership amounts to over 400 families. To bring such a group together, to get them to understand their own problem, Kelley had to hold meetings, to visit farms, to write for the newspapers, and to mail hundreds of letters.

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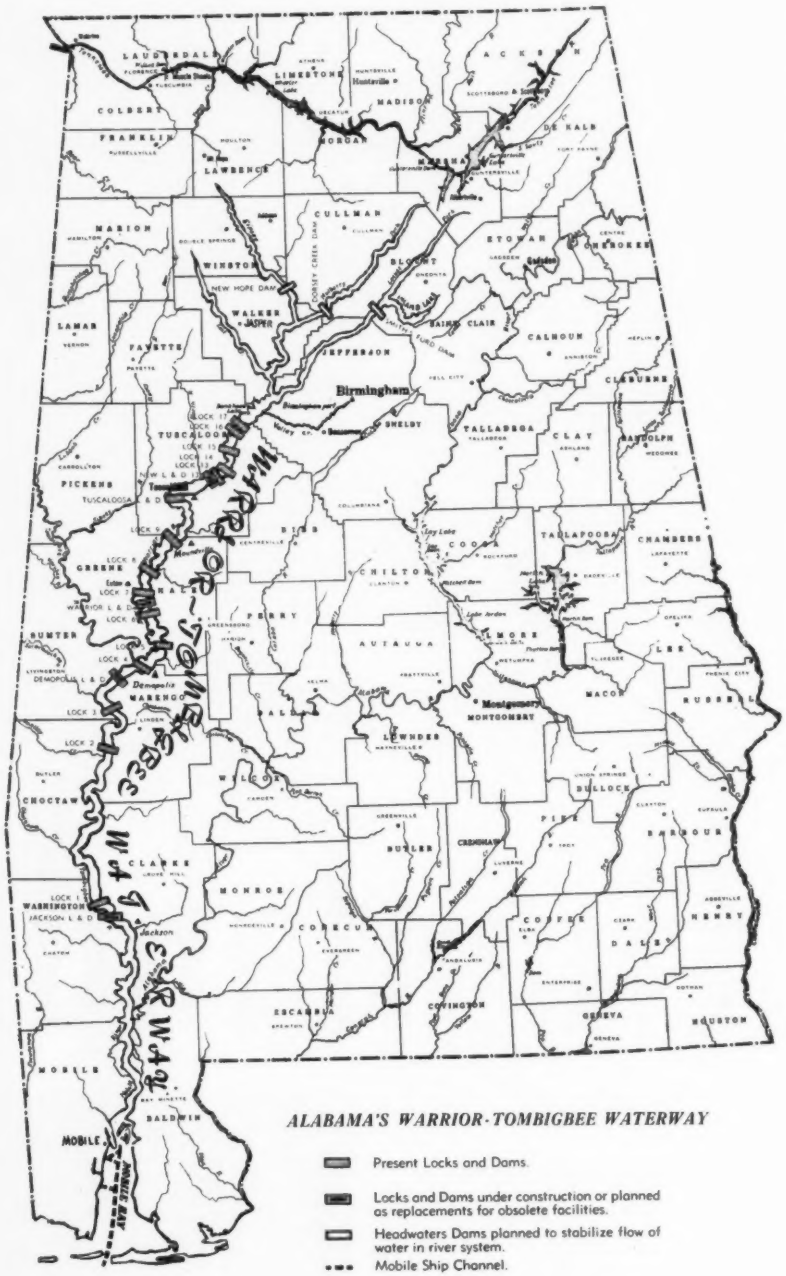


NOTHING could be finer

By LESLIE C. KENNON

New Bern, North Carolina, is a former Colonial capital where there are many stately homes dating back to the 1700s (Additional photos on next two pages)

"NOTHING could be finer" than a visit to the great state of North Carolina on that motor trip to attend the 80th annual meeting of The American Forestry Association in Jacksonville, Florida, this October 3-6. If variety is the "spice of life," then surely North Carolina could feasibly be labeled the spice of the tourist's life. In fact, Floridians who go on vacation quite frequently do so in North Carolina.

A 70,000 mile state system of toll-free and well-maintained roads, bridges and ferries makes traveling through this Southern Paradise a real tourist's pleasure.

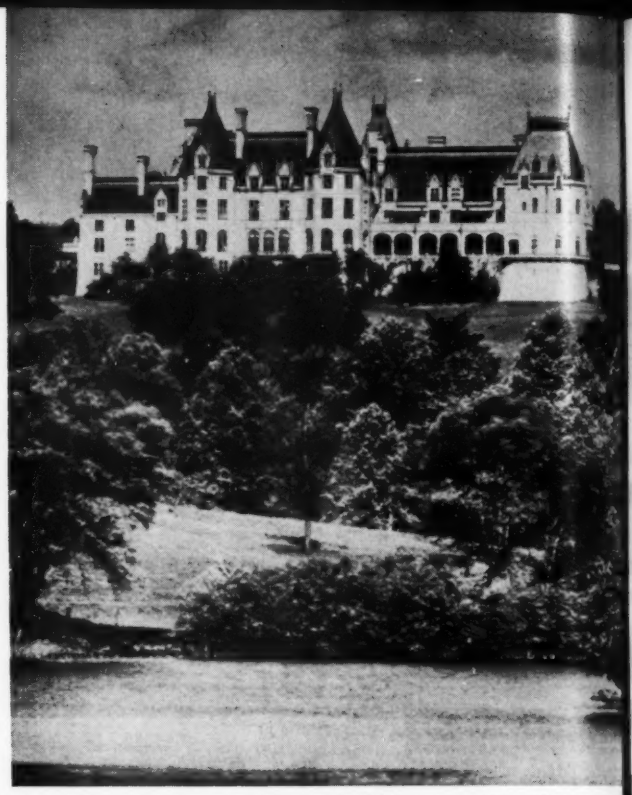
Festivals are just one feature of this great state — like the annual Azalea Festival which occurs in late March. From Greenfield Lake in Wilmington, the sub-tropical south-eastern corner of the 503-mile long state, a floral procession begins in February and moves north and westward to the Blue Ridge and the Great Smokies, where rhododendron

(*Turn to page* 63)

Cape Hatteras Lighthouse, in new Cape Hatteras National Seashore Recreational Area on N. C. coast

Nothing could be finer

Wright Brothers National Memorial, near Kill Devil Hills and Kitty Hawk, N. C., marks birthplace of powered flight. Annual ceremonies are held at Memorial each December 17



One of largest and most elaborate buildings ever planned as a private residence is Biltmore House, near Asheville, N. C. It was built by G. W. Vanderbilt between 1890 and '95

Scene from Cherokee Indian drama, "Unto These Hills." Two other outside historical dramas are presented in N. C. each summer, "Horn in the West" and "The Lost Colony"

Near Spruce Pine, in the heart of the mineral-producing region of western North Carolina, Roby Buchanan cuts and polishes native stones found in nearby mountains. Here he is at work on an amethyst

Visitors to N. C.'s Great Smoky Mountains often see black bears along U. S. Highway 441 in Great Smoky Mountains National Park, a tourist "must"

North Carolina's Pinehurst is famous golfing center where four championship 18-hole courses are in play from October through spring

Smokey Bear, who needs no introduction, is flanked by Mary Hughes, rhododendron queen, of N. C., and Ranger George Vitas, explaining poster.

Top of 6286-foot Roan Mountain, near Bakersville, North Carolina, is covered with natural gardens of purple rhododendron. Thousands of sightseers and camera fans visit this beautiful area in mid-June

William Logan Hall can look back on a lifetime crammed with accomplishments. But the achievement of which he is most proud is the role he played in the 1905 Forestry Congress

Apostle of the Forest Congress

By RAMON GREENWOOD

THE sun shone bright and warm on the western Missouri countryside. But it was still the middle of winter. A carpet of leaves inside the farm woodlot was decorated with traces of snow. In nearby fields ice still sparkled on tufts of grass.

The shouting voices of a nine-year-old boy and his father rang true and sharp in the crystal crisp air as they urged a stout pair of horses to drag an enormous white oak log from the woodlot to a small sawmill rig nearby. Catching his breath in excitement, the youngster repeatedly exclaimed that the tree was the largest he had ever seen, and his father told him it was more than 30 inches in diameter.

When the log was finally brought alongside the little mill and the man sat down to rest, the father spoke: "Look closely, Son. See those rings around the tree. Each one represents a year in the life of the tree. We can count them and find out just how old the tree was when we cut it."

That experience on a winter morning in 1882 brought the first acute awareness of trees and their uses into the life and career of a man who is one of America's oldest active, professional foresters, the most recent winner of the Gifford Pinchot Medal and a charter member of the Society of American Foresters.

Soon to pass his 82nd birthday (May 28, 1955), William Logan Hall's eyes sparkle with interest as he tells of that day almost three-quarters of a century ago, which he remembers "like it was yesterday," when he had his first experience in forestry on his father's farm near Warrensburg, Missouri. Though he didn't realize it then, that lesson with a giant white oak log was one of the most important factors in launching his work in forestry and has been a constant influence in his life.

Mr. Hall's actual working career in forestry dates back to just before the turn of the century and is still going strong. It has covered almost all phases of the profession from virtually every type of assignment possible in 20 years with the U. S. Forest Service, to private consulting, to operating his own tree farm and sawmill. It has been a career marked by many "firsts" in American forestry. He was one of the first to prepare plans for and work with private landowners in government-aid forest tree planting programs; first to suggest the fateful American Forest Congress of 1905; first to organize and direct activities of the Forest Products Research Laboratory at Madison, Wisconsin; first to purchase lands under the Weeks Law for national forests; first to advise on the formulation of a forestry program for the Hawaiian Islands and one of the first consulting foresters in the South.

But despite his long list of notable contributions to the profession, Mr. Hall, now a resident of Hot Springs, Ark., seems honestly overwhelmed by his success, and says so. He attributes much of his record to "many fine associates through the years." The memories that now come sharpest and clearest to Mr. Hall, even from early childhood, are woven around a close and deep association with things of the soil.

He recalls how at 13 years of age he plowed prairie soil never before touched by the blade on a homestead in southern Kansas, and saw in the distance the thin line of cottonwoods planted by homesteaders, standing straight and tall against the sky. "To me it was a striking revelation that man could actually go out and by his own activity bring a forest into existence. I had not realized it could be done." he relates.

Three years later his family went west to Colorado in covered wagons to homestead government lands and then came his first "practical experience in forestry."

"In addition to a homestead and a section of school land," he relates, "my father had taken up a timber claim which we planned to earn by establishing a tree plantation upon it. It was my job to turn up that prairie sod, go to the foothill arroyos and help gather cottonwood twigs for cutting and sticking into fresh, virgin soil."

But even today there is too little time for idle reminiscences of those yestertimes. The days are crowded with Mr. Hall's active duties as president of the Selma Timber Company, a small sawmill operation in south Arkansas, which he helped form, and the management of his 1,400-acre tree farm on which he has not allowed a tree to be cut without his personal marking since he began acquiring the lands in 1928. Then, too, there is the constant reading and studying to keep abreast of the latest developments in forestry. Any time left over is spent preparing autobiographical materials and a history of national forest land acquisitions.

As the man who first directed activities at the Forest Products Research Laboratory, Mr. Hall now sees, as he did in organizing the research facilities in 1910, a bright and almost unlimited future for the wood products industries. There will be, he believes, ever increasing demands for forest products, particularly wood fibers, and many new products yet to come from researchers' test tubes.

He recalls with amusement his first experience in trying to sell such thinking. When the Forest Service was first attempting to establish a central products research station, several staff members were called to appear before the congressional committee considering the request for funds. After much testi-

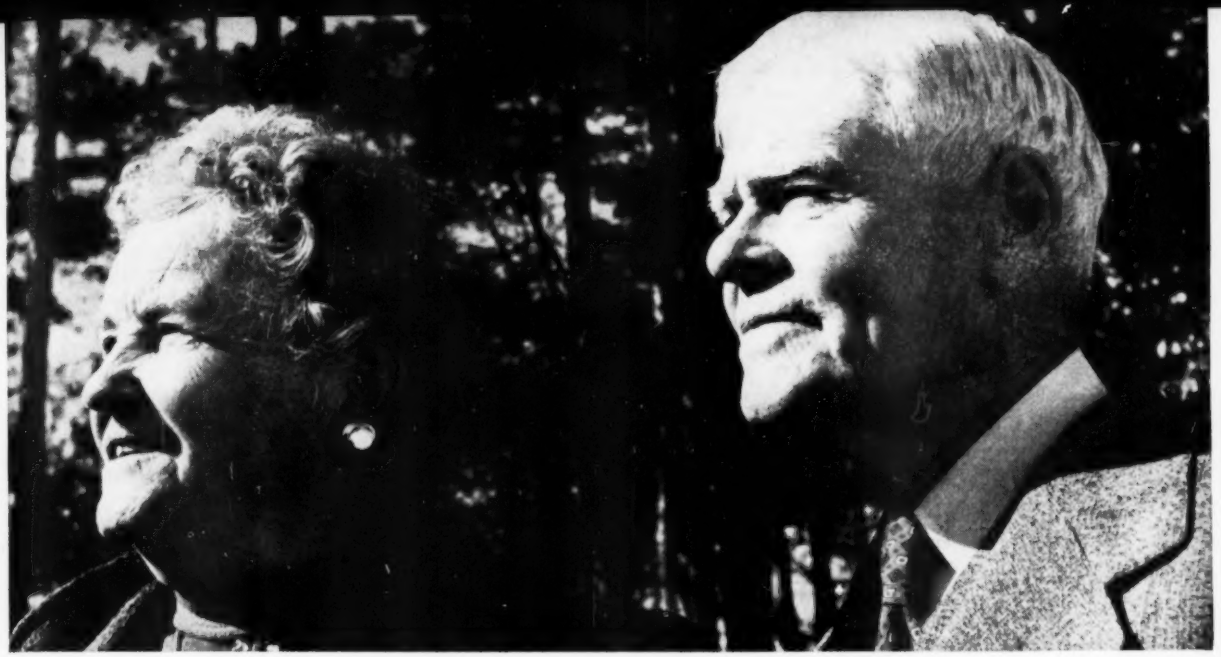


Photo by the author

Mr. and Mrs. William Logan Hall shown on their 1400-acre south Arkansas tree farm

mony by Mr. Hall and his associates, a member of the committee took the floor and demanded: "What would you do? We'd appropriate the money, you would build up equipment and an organization and in six months' time you would be through with your research."

"I don't believe it is ever best to assume that we know everything about any one subject," Mr. Hall declares.

He sees the future equally as bright with more and better trees being grown all the time. However, he does not go along wholeheartedly with the popular unlimited endorsement of research in genetics. Rather, he sees improved stocking and better forest conditions coming through more widespread use and improvement of the skills in fire control and timber management now in the hands of foresters.

"I believe there is a limit beyond which we don't want to go in growing super trees," he declares. But he asserts that there is plenty of room to better the forestry situation with more timber stand improvement, planting of unproductive lands and fire control.

In fact, Mr. Hall's philosophy of the profession is built around his belief that the greatest need today is not so much for development of new techniques but more widespread application of the basic principles already known to be sound.

"I wonder if some forestry schools are not giving too much time to theory and not enough to practical forestry; I wonder if forestry is getting too scientific, while we still have so many basic problems."

Dr. Hall began his formal career training at Kansas State Agricultural College at Manhattan, where he received a Bachelor of Science Degree in Agriculture in 1898 and a Master of Science Degree in Forestry and Horticulture the next year.

That year also saw Gifford Pinchot reorganizing the Division of Forestry in Washington and charting its history-making course. While these changes were being accomplished, word of young Hall's work in forestry at Kansas State had reached Mr. Pinchot and he prevailed upon the young man to take an examination for a position with the federal organization.

Actually, although he passed the examination, the young student had planned to go on to Cornell for graduate work. So, headed for Cornell's campus, he stopped off in Washington only for a quick look at the new organization. But an interview with Gifford Pinchot put an end to his journey.

"Mr. Pinchot and I had a wonderful talk, and I decided to join the organization," he recalls. "He was one of the most engaging personalities I have ever met—a striking personality and a master man of great ability. Not even Teddy Roosevelt had a greater personality."

Starting from a position as an assistant in the new tree planting program in 1899, Mr. Hall moved through 20 successful years with the U. S. Forest Service. He held positions as director of several phases of the agency's program including tree planting, research and land acquisition under the Weeks Law. He also aided in the organization of army units for forestry work in Europe during World War I.

Recalling those infant days of the profession, Mr. Hall says, "We thought we were making history ... but we weren't sure. Although we had deep faith in forestry, it didn't seem possible that such developments as we have seen could take place. Even Mr. Pinchot would be surprised today."

It was in those early days that Mr. Hall acquired much of the knowledge that has served him so well throughout the years. "I realized that I did not have a formal education in forestry as the others (Henry S. Graves, Overton W. Price, Ralph S. Hosmer) and this made me more alert. And Mr. Pinchot was always a great spur for me; I could do almost anything for him."

Rounding out 20 years of service with the federal government in 1919 at the age of 46, Mr. Hall resigned his position to embark upon a long and distinguished career in private forestry.

First he went to Chicago, but soon he became aware of the tremendous opportunities in the South and moved to Arkansas in 1925 to become one of the area's first consulting foresters. He recalls that he was

Highlights of AFA's
PROGRAM FOR AMERICAN FORESTRY

DRAWN up by distinguished leaders in all phases of forest and allied conservation, discussed and enlarged upon by a group of nearly 800 conservationists and public-spirited citizens at the Fourth American Forest Congress in 1953 and perfected and finalized by AFA's Directors with technical experts assisting, the Program for American Forestry was overwhelmingly adopted in 1954 by referendum vote of the members of The American Forestry Association. The Program recognizes three immediate goals for a national policy in forestry:

1. To meet the essentials of forest *protection.*
2. To improve the national *timber* crop in volume and quality to meet all needs.
3. To obtain the maximum of *economic* and *social services* from our forests.

The Program makes recommendations in five major fields:

I—Forest Landownership: Establish a joint Congressional Committee and a Governor's Committee in each state to determine a desirable pattern for ownership of federal, state and private forest and other conservation lands, to formulate policies, and to recommend legislation.

II—Forest Management: Improve protection, forest practices and needed planting on both public and private forest lands. Protect forests effectively from fire, insects and diseases. Practice sound forestry on all lands devoted primarily to timber production, with special attention to cultural measures, harvesting methods, access roads, full timber development, full use of trees cut, encouragement of consumer demand for available products, education of forest owners, and development of sound state forest policies for private forest land. Plant or seed inadequately or incorrectly stocked forest lands to restore them to valuable productivity.

III—Multiple-Use Policies: Establish priorities and plans to enable each forest area to contribute its maximum in products and services, including Conservation of Water, Forest Recreation, Grazing on public lands, Mining on public lands and Wildlife Management. Adjustments between conflicting uses and benefits must be made reasonably and fairly.

IV—Education and Assistance to Forest Owners: Public and private agencies continue, expand, improve and coordinate, with careful division of responsibilities, programs to educate and assist owners of small forest properties and small conversion plants. Improve forest taxation and forest credit and insurance facilities. Strengthen professional forestry training and intensify public education in forestry matters.

V—Forest Research and Surveys: Expand, determine responsibilities for and coordinate both fundamental and applied forest research, and speed up publication and application of findings. Continue and accelerate the forest survey and the participation of state and local industries in it, and provide for periodic reviews and improved techniques.

IMPLEMENTATION: The American Forestry Association accepts responsibility for publicizing and obtaining general acceptance of this Program and for advancing its recommendations nation-wide by state and national actions as they appear practicable.

attracted not only by his own observations of forest wealth but also by the attention being caused by Yale forestry class visits to Crossett, Arkansas.

Those early days, when he was one of the very few professional foresters in the state and the only one on a consulting basis, saw him serving the Dierks Lumber and Coal Company as it launched a forest management program, managing lands for various other owners and helping to bring International Paper Company's mills into Arkansas and Louisiana. He soon was working all over the South for many different concerns.

It is not difficult for the visitor to determine which of Mr. Hall's many achievements he counts as most important. Heading the list are his proposals that led to the holding of the second American Forest Congress of 1905 and participation in the organization of the Society of American Foresters.

Mr. Hall's suggestion for holding the Congress came in 1904 after several months of study and consideration on his part. At a staff meeting of the Bureau of Forestry, he urged that such a conference be held in view of the great developments in every phase of forestry and the legislation then being considered to establish the Forest Service. "Mr. Pinchot and others agreed almost immediately, and I was named to work out arrangements in cooperation with The American Forestry Association in which we were all active," he relates.

Over 500 persons attended the Congress and among them walked the giants of early American forestry like Theodore Roosevelt, Fred Weyerhaeuser, Gifford Pinchot, N. W. McLeod and many others. Mr. Hall was named secretary of the conference.

"A great meeting," Mr. Hall remembers, "and a turning point in American forestry. It was at this meeting that the whole program was given the impetus it needed to get favorable attention in Congress and with the people." (For present program, see box on this page.)

It was also in Mr. Pinchot's office where the other high point of his career came. For there, seven men—Gifford Pinchot, Henry S. Graves, Overton W. Price, Ralph S. Hosmer, Thomas Shirard, F. E. Olmstead and Mr. Hall — drafted plans and established the Society of American Foresters in 1900. Only two of the original seven — Mr. Hall and Ralph Hosmer — live today.

Assistant Secretary of Agriculture E. L. Peterson, whose address was read by True D. Morse, Under Secretary of Agri.

The Earth

Our Greatest Sponge

Importance of underground water storage capacity is stressed at annual meeting of Chamber of Commerce

WHEN people think of water storage they commonly think of dams and reservoirs when actually there is more water storage capacity in the ground than in all man-made reservoirs, Assistant Secretary of Agriculture Ervin L. Peterson told delegates at the Annual Meeting of the Chamber of Commerce of the United States last month.

Just the same, cities must plan for more storage space for surface water if they are to provide for the needs of growing populations, said Harry E. Jordan, secretary of the American Water Works Association. In 1890 the average city used 95 gallons of water per person per day. By 1955 per capita consumption and use has grown to 145 gallons. And by 1975 this consumption will hit a peak of 175 gallons. What do people use it for? 1) More bathing; 2) more water connected laundry and kitchen equipment; 3) more lawn spray and irrigation (which is growing rapidly in the East); 4) air conditioning both in homes and offices. It all boils down to the statement that "Cities grow, Rivers do not" Mr. Jordan said. This is why cities must provide for more storage space, he declared.

A third speaker, Kenneth M. Lloyd, secretary of Youngstown, Ohio's Mahoning Valley Industrial Council, concurred with Mr. Jordan. The fresh water supply in the United States is not unlimited, he said. If the large potential of our surface water is to be put to a practical and logical use in many places, extensive application must be made of new storage and artificial regulation. Of interest was Mr. Lloyd's statement that on the bright side surveys have shown "that the total water resources of the nation have not changed in any appreciable degree within the last 75 years." When asked if it wasn't true that the "water table in the country is dropping," Mr. Lloyd replied that underground water is a "rechargeable natural resource." Like a reservoir on the surface of the ground, underground pools can be replenished, he said.

The statements by both Mr. Jordan and Mr. Lloyd served to give great weight to Mr. Peterson's premise that forest lands and their proper management are of basic importance in water development and management because here is where the great bulk of the nation's water is held in reserve in nature's own reservoir—spongy land. As presented by Under Secretary True D. Morse (Mr. Peterson was ill), the assistant secretary's paper emphasized that unless water is held on the forested watersheds there certainly will not be enough for the increased storage reservoirs anticipated by Jordan and Lloyd.

For instance, in the eleven western states it is estimated that the national forests yield 53 percent (183 million acre feet) of water run-off but occupy only 21 percent of the area. Most of the water that makes possible the irrigation of 21 million acres of food-producing lands comes from national forest areas. Great strides made by private forestry in sound forest land management practices are also of great importance to the management and development of water supplies for a growing nation, Mr. Peterson added.

Mr. Peterson's paper stressed further that "we need to recognize that the management of water begins where the rain and snow fall upon the earth" consequently, he added, soil and water use are inseparable for resource management purposes.

For example, a study in North Carolina showed the cost of filtering mud out of municipal water originating on eroding watersheds was 27 dollars per million gallons. By contrast, water from well protected forest land cost $8.50 per million gallons, Mr. Peterson said.

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Frank E. McCaslin, right, explains an exhibit to Harry E. Jordan, Kenneth M. Lloyd, and True D. Morse, left to right

THE WILD

By ARTHUR C. PARSONS

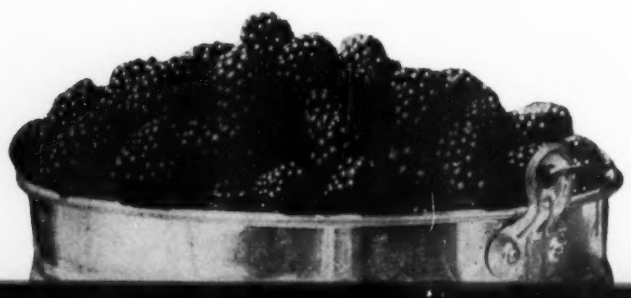
AWAY back in 1915 I had a real windfall—the proprietor of a local hotel asked me to supply him with one hundred quarts of blackberries at ten cents per quart with delivery scheduled for ten quarts at a time over a two-week period. What country boy could ever resist so lucrative an offer for such an easy job as picking berries, a task I had to perform for my mother for nothing? (That is, for nothing except the fresh blackberry pies, cobblers and muffins that she made for us.)

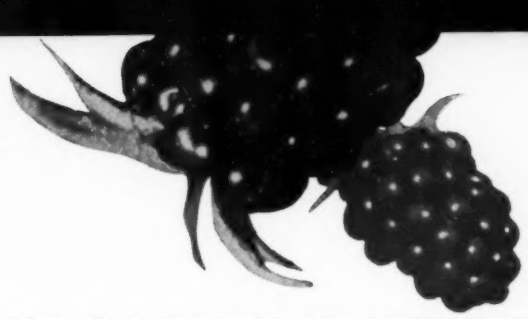
I accepted the hotel contract which proved to be rather more difficult than I had anticipated because of the inevitable August drought and because several other people found a secluded patch in low-lying, damp ground that I had considered my own personal property even though it was on state land. However, by the first of September I had fulfilled the contract and for a short time I was unbelievably wealthy at a period when ten dollars was really big money. Cash was not the only remuneration; I had a great feeling of pride and self-satisfaction when I attracted the approving glances of passers-by as I walked down the street toward the hotel, carrying in each hand a heaping five quart pail topped, of course, with the largest and finest berries that I was able to find that day. And I might add that I also had my scars from the sharp thorns of the tough, mountain briers as well as a few lumps caused by picking yellow jackets and bald faced hornets that I had failed to notice when I reached for the berry clusters.

At that time many wood alcohol plants (we called them "chemical factories") were in operation in northern Pennsylvania, and whole tracts of timber were clear-cut to provide the wood necessary to keep the stills running night and day. Soon after the trees were removed fire weed, poke weeds and wild red and black raspberry canes appeared and, a year or two later, the blackberry briers began to take over only to be crowded out in their turn by fire cherry, wild black cherry, maples, beeches and other hardwoods. The blackberry crop was wonderful during the few years that it lasted; thousands of pickers came to the denuded hillsides by horse and buggy, by Model T and on foot to pick berries by the hundreds or even thousands of quarts for canning, jelly and jam, and perhaps even for blackberry wine and cordial. Some families would put up two hundred quarts or more in various forms for winter use. Our family was small—one big day's picking at the height of the season by the four of us was usually enough to can the 50 or 60 quarts that we needed for pies and "sauce" during the cold months. All we required for fresh blackberry pies and for several quarts of jelly and jam could be obtained in smaller quantities over a two week period.

I have often wondered what the yield per acre was from some of those large patches. One man who sat on his porch and watched the pickers come and go told me that he estimated that 10,000 quarts had been picked from one hillside on Kinzua Creek and that "they had knocked down and trampled twice that many."

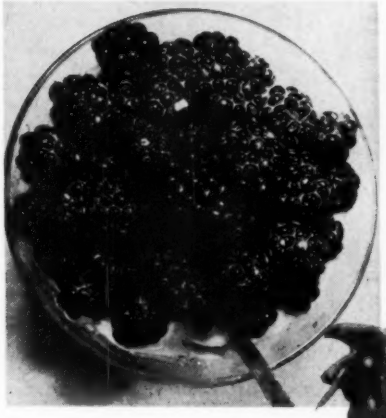
During the past few summers I have returned to that neighborhood several times and again have picked many buckets of large, sweet berries from the same hillsides. After nearly 40 years some tracts of privately owned timber have been cut almost clean once more and several others have been harvested scientifically by a large paper company which has a hungry pulp mill some miles away. The briers on both cuttings seem to





Versatile is the word for the blackberry. The bush is beautiful to behold and the rich, juicy fruit is the delight of any gourmet

BLACKBERRY



be as thick as I remember them from long ago; the hills are covered with an almost solid mass, criss-crossed by paths beaten down by hundreds of berry pickers of a new generation.

How does it happen that the blackberry bushes have come back in the same places and in approximately the same profusion as they were some 40 years ago? There is some question concerning the longevity of seeds of many types, but I believe that many of the canes may have sprung from seeds that have lain dormant for long periods and have come to life when the sunlight has again been able to penetrate to the forest floor. One seed expert informed me that he believes that blackberry seeds will germinate after a long period of time — he would not specify any definite number of years — and another told me that he frankly did not know the answer to my question. Of course, there are other ways that they can spread; there are always some canes growing along the edges of the woods, along the roadsides and in clearings where the timber has failed to come back, canes which provide seeds which can be scattered by the droppings of many birds and animals which feed on them. However that may be, the growth of a new patch is quite rapid once a good start has been made in good soil with a fair amount of moisture and other favorable conditions.

The blackberry cane, like many others, grows one year, bears its fruit the next, and dies shortly thereafter. Each year new canes come from the root of the old so that the stand is constantly perpetuated. The new growth is a light green in color and by the end of the growing season has reached full size which varies according to the type to which it belongs. The second year it usually turns brown or reddish brown, is considerably stronger with heavier thorns that can rend and tear both clothing and flesh. The bloom appears from April to June, depending, of course on latitude and altitude as well as on weather factors, and the fruit [illegible]om June to September or [illegible]r.

Blackberries of one variety or another occur in much of the world; there are said to be about 150 types in Europe and Asia, but those found in Europe appear to be somewhat inferior to those found in the United States. In general, Europeans do not hold blackberries in the same high esteem that we do. Several northern Europeans have told me that they used to pick a few to eat as they walked through the woods or along the roadways, but their families never bothered to pick them in quantities for canning and preserving as we do in this country. One elderly Spaniard told me, "Sure, I used to eat *'zarzamoras'* when I was a shepherd in Spain, but they weren't as big and sweet as the ones I find here." William Byrd, in his *Natural History of Virginia,* says that there are two kinds in America, the red and the black, and that both are better than European berries. Apparently he did not observe too care-

(*Turn to page* 40)

Nearly 100 percent of oak near Westfield, Mass. died after attack by gypsy moths

THE UNCONQUERED GYPSY

Two years ago scientists thought they had these moth caterpillars on the run, but the voracious little beasts came right back to set a new eating record

By M. D. BELLOMY

IN the early spring of 1953, scientists were jubilant over the progress in their campaign to conquer the Gypsy moth. No heavy outbreak of the pest had been recorded since 1945. Their battle had been intense, hard-fought. Success would be sweet. When the summer of that fateful year had come and gone, the awful truth was revealed. The Gypsy moth was not conquered and probably would not be for many years to come. Gypsy moth caterpillars set a new eating record during the summer of 1953. They ate the leaves off 1,500,000 acres of New England's beautiful hardwood trees.

Previous record outbreaks of the Gypsy moth occurred in 1937 and 1945. In each of those years approximately 600,000 acres of trees were damaged. 1953's record defoliation is more than both of those years combined.

Gypsy moth caterpillars can be seen beneath burlap band wrapped around tree

A researcher studies cage containing virgin female gypsy moths used in lab tests

Metal cylindrical trap about 12 inches is used to catch male gypsy moths for study

Science was to blame, indirectly, for bringing the Gypsy moth menace to this country. Although unintentional, the Gypsy moth fiasco has cost the United States nearly $1,000,000,000 and has required 86 years of constant warfare to even partially control the invasion. Today science, with the aid of planes, sex attractant traps and insecticides, is taking a deadly toll of the pest but the Gypsy is a long way from being conquered.

In 1869, a number of egg clusters of a European moth were brought to Medford, Massachusetts from France by a scientist named Trouvelot. He believed it possible to cross the Old-World moth with silkworm moths and thus develop a hardy race of silk-spinning caterpillars which would be immune to the plague then attacking silkworms. It was a brilliant idea. If a successful cross could be made, the United States would be in a position to equal if not surpass, other countries specializing in the art of producing raw silk.

The Gypsy moth was the species chosen by the Frenchman for testing. The male is brownish-yellow varying to greenish-brown in color. His body is slender. His wings are marked with black, and expand to an inch and a half. He is a strong flyer and nearly always chooses the daylight hours for flight. The female Gypsy is nearly white. Her wing markings are black, too. Her wingspread is almost two inches. Even though she has larger and seemingly stronger wings than her mate, she flies rarely and then, extremely short distances.

Little did anyone begin to realize that disaster was to follow in the wake of the innocent-looking moths nor could even wild imaginings begin to estimate the millions of dollars, and the almost countless number of manhours that would be spent trying to rid the country of the alien pest.

Upper left, egg clusters; upper right, larvae; lower left, pupae; lower right, male and female moths, with male at top

The trouble actually started one day when a gust of wind upset a small box sitting on Trouvelot's window-still and spilled the contents onto the lawn below. Ordinarily, a box blown off of a window ledge would not cause any spectacular after-effects. This was no ordinary mishap, however. That ill-fated box contained eggs of the Gypsy moth, and with the help of an obliging wind, the eggs were soon scattered around the grounds of Trouvelot's estate. It has been said that Trouvelot didn't know "the gun was loaded." Quite the contrary. The scientist searched diligently, desperately, but even with the help of a magnifying glass, he failed to recover all of the eggs.

Trouvelot was well aware of the seriousness of the situation and reported the mishap at once. Apparently, he believed the simple truth would be sufficient but the American public, having no particular knowledge of the insect, paid scant attention to his warning that the Gypsy moth was at large.

Time passed. Five years, ten years. Few people remembered Trouvelot and his little Pandora's Box of moth eggs. Then came the Spring of 1889, exactly twenty years after the fateful egg-spilling, and the easy-going American public was rudely awakened. When the residents of Medford, Massachusetts opened their eyes that unforgettable morning, a terrifying sight greeted them.

Every tree had developed a new kind of "blossom." Caterpillars by the thousand covered almost every living green thing. Overnight, it seemed, the Gypsy moth had accomplished a full-scale invasion. All over town, caterpillars were so thick it was impossible to estimate the number taking part in the king-sized raid.

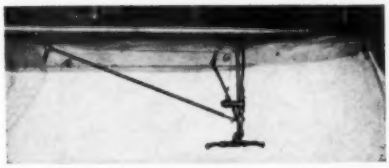
Everywhere, the "worms" squirmed, wiggled, twisted, dropped, or climbed. Just walking along the street, a pedestrian would leave a trail of squashed bodies behind. They invaded gardens and homes, hiding under pillows and bedclothes, and even finding their way into clothes closets. Nothing was ignored. The insects' voracity and curiosity knew no bounds.

E. P. Felt of the Bartlett Tree Research Laboratories of Stamford,

(*Turn to page* 56)

Turbine blower being used to treat roadsides with DDT in battle on gypsy moths

Planes, too, are widely used to spray infected areas with concentrated solution



Above, distribution apparatus attached to plane. Below, spinner disc unit of tool

Austin Cary

Yankee Peddler in Forestry

By FRANK HEYWARD, JR.

(*Conclusion*)

NO Forest Service representative in history did more to encourage and promote solid forestry in the South than Austin Cary. His blunt honesty and tart, practical comments appealed to southern pine industry leaders who still claim that "Austin Cary gave us our start."

Cary believed in the future of southern forestry at a time when that region's prospects were being portrayed in drab tones by many leaders. Moreover, he believed in the ability of southerners to work out their own problems over a period of time.

Consequently, he had no sympathy for either federal forest regulation or extensive land acquisition programs by federal government. At a time when his own office was "full of the buzz of regulation" (as he phrased it), Cary trumpeted "We're winning out — the truly sane, cooperative men." Nor did he hesitate to make his convictions known to the Washington office of the Forest Service.

In numerous letters Cary described the timber production possibilities of the South in glowing terms. Of southeast Georgia he wrote as follows; "My own belief, in fact, is that no region in the world probably has greater natural facilities for producing timber values than the district centering on the Okefenokee Swamp. . . . Longleaf, and particularly slash pine, characterize this region, the latter is my opinion a species which will be recognized in future, for the combination of utility of its products, for its readiness of reproduction and rapidity of growth, as one of the most valuable trees on the earth's surface."

Writing to an Alabama lumberman, he stated: "We agree that southern lumbermen are frequently in need of waking up to the value of a second growth of timber; people in general in the South also. With the vast area of the South, its sparse population comparatively and the rapidity with which timber grows, the South we feel, ought to produce *half* the lumber needed by the United States and that of course to its great profit financially."

His deep conviction of the South's future is eloquently expressed in his letter of December 19, 1924 to R. W. Fullerton, Bradley Lumber Company, Warren, Arkansas, after recovering from an illness, "I sit in the office these days, but in every slack in attention my mind goes off to the South, to the friends and acquaintances I have there, to its problems, to repeated thought over its wonderful advantages. Some day its people are going to realize these last in the timber line, and then *what a timber garden it will be!*"

No reference to Austin Cary the man would be complete without reference to his freedom of personal inhibitions and his complete lack of formality. Stories by the dozens are told about him wherever his name is mentioned in coversation. His fondness for removing his shoes after dinner was a trait well recognized by his countless friends as brought out in a letter from the late Posey N. Howell of Mississippi. Howell, probably the earliest advocate of fire prevention in Mississippi, was a close friend of Cary's. He wrote to Cary, "Mrs. Lillian T. Conway of the Forestry Department was on a trip down here recently and I accompanied her one day. She spoke very highly of you and the only criticism she made was that you sometimes went to dinner parties and pulled off your shoes if they hurt your feet. I told her that was a privilege that all practical woodsmen reserved for themselves."

Attached to the above letter is the following note in Cary's handwriting, "Marked passage on second page of this letter referred to Mrs. Conway, who will please state basis for

the allegation. I did bring a pair of uncomfortable shoes from France, but when did I ever attend a dinner party?"

One of the most interesting features of Cary's files is the numerous references to large timber tracts as they were first placed under management and to specific companies which were beginning to acquire lands for continuous production. For example a letter from the late Jim Allen to the Chief Forester in 1925 requesting management advice on lands recently acquired by the International Paper Company in Arkansas was referred to Cary. Jim Allen was one of the powerful forces behind the construction of a number of the South's paper mills, first for International Paper Co., then Union Bag, and finally his own company Florida Pulp and Paper (later purchased by St. Regis). Jim Allen used the term "timber farm" in describing these lands in a release to the press in 1925.

A highly enlightening exchange of correspondence took place between Cary and the Lukes of West Virginia Pulp and Paper Co. Cary called on David L. Luke at his New York office in 1918. He interrogated Mr. Luke on his ideas regarding the possibility of development of the paper industry in the South. This interview was briefed by Cary for his files and checked by Mr. Luke. Highlights of the interview as written by Cary follow: "Kraft paper is the only line possible for the South and success in that in normal times is doubtful. Chemicals are costly in the region and coal as a rule fairly so. The sulphate and soda processes both take much fuel and wood fuel is a possibility only in connection with large sawmills.

"Labor is a big element in paper making, and the South is at a disadvantage here. Mosquitoes, malaria, etc. are widely prevalent, and the class of men required for the work will not stand them. Natives seldom have ambition and gumption for some of the work required."

In this same file but written in 1922 is a letter from Charles W. Luke, vice president, stating that he was planning a trip into the South, ". . . and while there have a notion I would like to look over some properties which have been referred to us from time to time. I had a notion possibly you would know of tracts in addition to those that we have on file. . ." The following year Cary was asked by West Virginia to look over certain lands in South Carolina being considered for purchase. These lands included those of Prettyman & Sons Lumber Co., and E. P. Burton Lumber Co. Cary had been in close touch with early management activities of the Prettyman lands. The Burton lands are of interest because it was for this property that the Forest Service in 1902 (then the Bureau of Forestry) had prepared one of its first management plans for private land. Answering Mr. Luke's request to examine these lands, Cary wrote, "The job which you outline in your letter of June it is my official business to do, also it is the kind of job I most enjoy."

West Virginia purchased the Prettyman and Burton lands, and today they are an integral segment of that company's splendid timber holdings in South Carolina. Historically they are interesting as examples of some of the first forest management practices to be found in the South.

Cary's Views on Fire

Austin Cary was one of the first foresters to realize that, under certain conditions, fires have a place in management of southern pine. It is possible that his thinking on this subject was influenced by H. H. Chapman for whom he had great admiration and who in turn respected Cary's viewpoints profoundly. In a letter written June 2, 1926 to H. H. Tryon, Extension Forester of South Carolina, Cary stated, "Throughout my professional life I have not been the extremist about fire that some men are though of course knowing well the enormous damage it does. Many years ago, in New England, I thought I saw places where fire had done good, for instance, where culled and very unpromising stands had been replaced by fresh growth of better varieties and more rapid production. The idea occurred to me then that perhaps we should use that idea some day, though as a matter of policy I think I never gave public expression to it. But I have had no reason since to change my personal views on the matter.

"In the South again my mind from the beginning has been open. I do not suppose that anyone realizes more strongly than myself the vast damage uncontrolled and irresponsible fire is doing in the South, the necessity for converting the people to different practices, and ideas that many hold at present. At the same time I have been open to the belief that fire might do good sometimes; the idea of employing it as a cultural measure even does not shock or repel me."

To the Stephens Lumber Co., Jacksonville, Fla., in 1923 Cary wrote: "Some men count on an annual fire, defend it even—good men too, Mr. Wilder (pioneer timber cruiser), for instance. I believe myself there is a measure of truth in their idea, that fires which run at certain seasons and in certain conditions, may be a means of protection for timber already started. Of this, on the other hand, I feel equally sure—that growth of young timber is checked and that new growth cannot get a start under conditions of repeated and untimely fire."

In April 1924 Cary wrote the Carolina Fibre Company, Hartsville, S. C. concerning possible use of fire, "But instead of keeping fire strictly out of such territory, as you are attempting to do today, it strikes me it might be preferable under the conditions to burn the land over about once in two years: lightly, at times when fire will do the minimum of damage. The considerations here you understand, I think, lessening the risk from untimely fire, cleaning bushes and tree reproduction out from where they constitute a nuisance, the saving of expense possibly. Of course, we believe on the other hand that some growth is sacrificed by this course as compared with the growth rate where fire is entirely excluded. In accordance with our verbal agreement I am putting up to the Branch of Research of the Forest Service the idea of making careful tests on this last point in cooperation with you and in your territory."

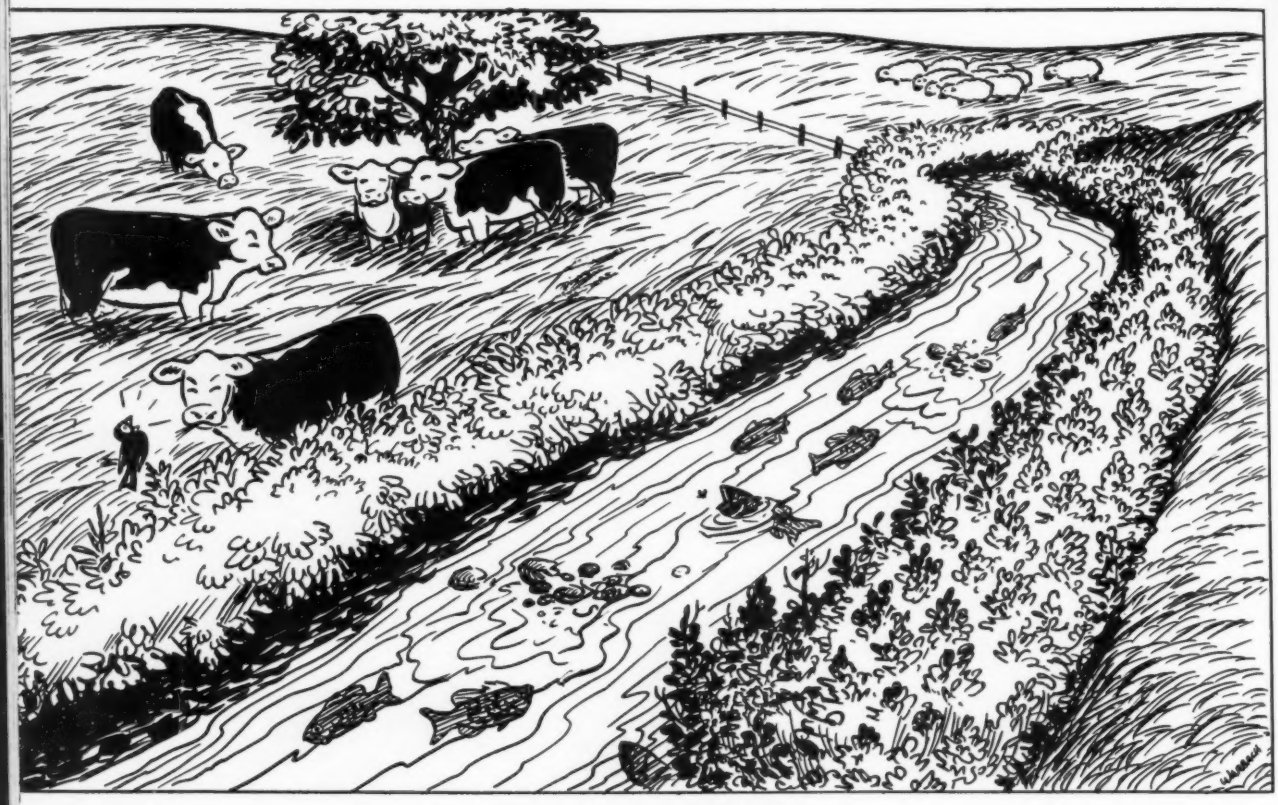
When the use of controlled fires in the South was first being considered by the forestry profession as a whole, approximately the period 1935-1940,

(*Turn to page* 52)

Though not too strong on "book forestry," Cary, a master at the pungent comment, nevertheless left a mark on his profession

GRAZING AND FISHING

By R. W. ESCHMEYER



Good grazing—good fishing

COWS and sheep live on the land. Fish live in the water. Offhand, there doesn't seem to be much connection between the two. There is, however. What the livestock do on the land can affect your fishing very decidely. The cows and sheep, indirectly, can help to improve conditions for fish; they can destroy fish habitat, too.

We know of some rolling country where the farmers raised many acres of row crops—corn and tobacco. On the cultivated hillsides, mud washed down hill during heavy rains. The mud entered the streams. So, the rivers and lakes in this area were usually very muddy. The game fish, which feed by sight, couldn't find their food. The food was scarce, too, because it couldn't grow well in the dark, muddy water. There weren't many fish in this water. You couldn't catch many of them when you went fishing.

In this area, the farming has changed. The farmers began to raise more cattle, less row crops. Some of the land which had been cultivated was made into pastureland. Grass was grown in many of the fields which formerly supported corn and tobacco.

Then, during rains, most of the water soaked into the soil. The grass held the soil on the land. It no longer washed into the streams. The streams became clear again.

The game fish could see their food again. There was more food for these fish, too. Fishing has improved greatly in this area. Indirectly, putting more land into pasture, and less into row crops, meant improved fishing.

In this instance, grazing restored the fishing. In many places, though, over-grazing destroys the fishing. There is over-grazing on some of our federal land, and also on some private land.

When too many livestock are grazed on the pasture, the grasses are destroyed. The rain water no longer soaks into the ground. It rushes down the hillsides and into the streams, where it causes floods. When less soaks into the ground, the springs stop flowing during long dry spells. So, we have high water

Poor grazing—poor fishing

in the streams at times, and very low water or none at all at other times.

With highly uneven flow, the streams are poor habitats for fish.

Too much grazing harms the stream in other ways, too. The cows and sheep destroy the bushes which grow along the edges of streams. These bushes furnish shade, keeping the water cool. They also prevent erosion and collapse of overhanging stream banks. Too much grazing can destroy the hiding places of the fish. It can change a fine well-shaded stream into an open ditch which can support very few fish.

Over-grazing hurts the pastures as well as the streams. Weeds gradually replace the grasses. Too, the gullies that form don't produce food for cattle and sheep. Where the land is grazed too heavily, it will support fewer livestock in the future.

Many farmers have learned that over-grazing harms the pasture. They have also learned how to improve their pastureland by fertilizing and planting suitable grasses and other food for the livestock. They now understand that the all-important topsoil must be kept on the land, and that much of the rain must soak into the soil. This improvement in the farm pasture will benefit our fishing.

The most serious over-grazing now tends to be on federal land, on the lands operated by the Bureau of Land Management of the Department of Interior and by the U. S. Forest Service. These public lands, especially those of the Forest Service, attract some millions of anglers each year. In the national forests, alone, there are 81,000 miles of fishing streams and over 2¼ million acres of lakes.

We can't let over-grazing on our public lands destroy the fishing waters.

There happens to be a close connection between cattle and sheep—and fishing. Where the pastureland is properly grazed there can be good angling in the streams and lakes of the watershed. But, over-grazing destroys your fishing.

"Gives You Confidence on the Mountainsides"

UPROOTED AND MOVING, this giant tree stump proved no match for the 161-maximum drawbar horsepower the TD-24 crawler brought to bear on this particular road-building task.

Washington TD-24 operator says:

"I work these slopes with confidence because I've never had a tractor under such perfect control"

"It's impossible to attain peak production logging on mountainsides unless your operators have complete confidence in their crawler tractors."

So says L. G. Cunningham, Concrete, Washington, who operates two TD-24s and a TD-18 in conjunction with his logging camp on the nearby slopes of Sauk Mountain.

And skinner Bill Harris, says:

"I quit wrestling levers when I became a TD-24 operator. The two-speed planetary track control took all the hard work out of this job.

"I never had a tractor under such perfect control before. It gives you confidence on these mountainsides."

The INTERNATIONAL TD-24 (with 161 maximum drawbar horsepower) has plenty of other pay-off features. It packs the load-lugging power to go and get the biggest loads with winch or arch . . . in places where it will not pay to operate with any other crawler. It can punch out access roads, too, like the champion it is . . . faster, for less money per mile, to help keep your operations profitable.

Spend only a few minutes to get the full facts. Call your INTERNATIONAL Industrial Power Distributor for a TD-24 demonstration . . . with winch, arch or any of six dozer blades. Give it a trial where the going is toughest on your show. Add up the results and you'll want TD-24 power producing for you from then on.

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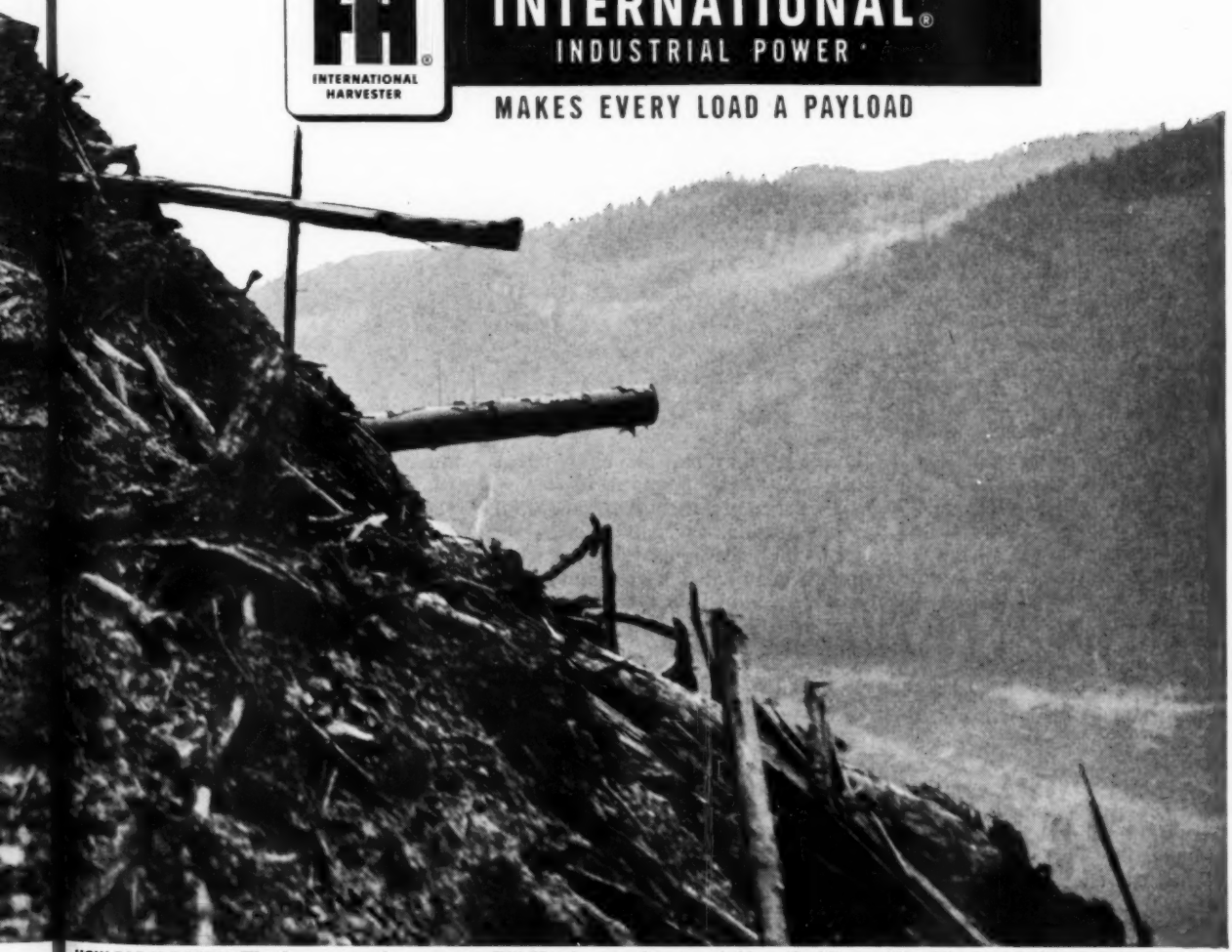
INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD



HOW FAR IS DOWN? That's one question operator Bill Harris never has to ask himself while working his way up the west slope of Sauk Mountain. He knows he is in complete control of this road-building operation . . . that he can work right up to the drop-off point and have no fear of the TD-24 not answering every demand, instantly.

Learning to recognize practices that contribute to watershed damage and taking immediate corrective measures can save a lot of trouble with the land

By CLARK H. GLEASON, PAUL E. PACKER, and ROY D. HOCKENSMITH

WATERSHED DAMAGE

. . . . . *its signs and causes*

DAMAGE to the land, local floods, and costly repairs can be avoided if the signs of watershed damage are recognized in time. Basically, watershed land has six deadly enemies—all the result of man's excesses. They are: poor methods of cultivation, excessive grazing, careless logging, fire, mining operations that leave the earth's surface torn up and unsecured, and road building methods that fail to make any effort to hold soil in place.

A watershed is considered to be damaged when surface runoff and erosion on its slopes or in its channels are accelerated by the activities of man. The quick runoff of storm water from bare hills makes flood peaks higher; the short duration of their flashy flows reduces the yield of water that is usable; and water that runs on the soil surface instead of going underground is not available to replenish wells and springs.

The damages from erosion amount to more than just the loss of soil in the watershed. Eroded debris carried by the runoff reduces the rate at which water can seep into the ground; causes rapid sedimentation of water storage reservoirs; makes flood flows greater and more destructive; causes deposition damage on agricultural and urban land; and shoals navigable streams and harbors. Thus the effects of watershed damage are felt not only in the damaged part of the watershed, but in places that may be many miles away.

Freshly-cut rills and gullies on a flood-source site quickly concentrate rainfall into drainage channels

Evidence of existing and potential watershed damage can be seen on the land if the observer knows what to look for. Rills, gullies, and newly exposed plant roots can often be found on slopes. Banks undercut by high water, channels gouged deeper by runoff, and freshly deposited sand and gravel are signs of damage along stream channels. And muddy water in streams, farm ponds, or reservoirs shows that soil has been washed down from higher-lying lands. All these are indicators that watershed damage has occurred.

There are also indicators that the stage is set for damage to occur. On land that is not cultivated, sparse plant cover and areas recently denuded of plant growth are good indicators of potential erosion damage. On cultivated land the use of cropping practices that keep the soil bare through the seasons of heavy rain or wind are indicators of potential erosion, and this is also true of up-and-down-slope cultivation. These are only a few of the indicators of watershed damage that can be observed.

A look at the effects of several land uses in a number of places in our country will illustrate some of the commoner evidences of watershed damage, and their causes. These examples may help the reader detect such damages and judge the need for watershed protection in his own community.

Cultivation may cause damage

to watersheds. An example is found in the watershed of Mule Creek, in western Iowa. About 87 percent of the watershed is cropland, with corn the predominant row crop.

Gully erosion is common in the upland area. Almost every storm cuts rills and small gullies. Twenty-two major gully-heads are cutting rapidly into the land, often extending 100 feet or more in a single year. Many of the gullies are half a mile long, 10 to 20 feet deep, and 40 to 60 feet wide. Gullies that are too large to cross with farm machinery have divided some fields into two or three sections, some so small that they are not economical units to farm. Little by little, the area that can be farmed is being reduced.

By undercutting their banks, the streams are eating back into cultivated fields and destroying productive land along almost the entire length of Mule Creek and its branches, and making bridge replacement and road relocation necessary.

Sheet erosion is not so obvious as gully erosion. Close examination after a storm, however, may reveal particles of soil splashed on the leaves of plants by raindrops. A puddled soil surface that forms a crust upon drying is another evidence here of soil disturbance by raindrops and sheet runoff. And pedestals of soil capped by stones or resistant clods can often be observed. Because these indicators are hard to see, sheet erosion goes on almost unnoticed except where the topsoil is becoming thin. This is usually shown by a change from darker to lighter soil color as the subsoil is exposed, and by the poorer growth of crops.

Landowners and operators within the Mule Creek Watershed have developed a plan for the protection and improvement of this watershed and work has begun.

Grazing by livestock is another important land use that has caused watershed damage in many places.

In the Payette River drainage basin north of Boise, Idaho a thunderstorm on the evening of September 11, 1952 caused heavy runoff and flows of mud and rocks that blocked the highway and partially dammed the river itself. The floods came from twelve tributary watersheds on the north side of the Payette River. The discharge from one watershed of 400 acres was sufficient to cut a gorge 15 feet deep and to pile mud and rocks on the highway to a depth of 40 feet. Similar but smaller floods had occurred here twice in the preceding 10 years, giving warning of trouble in the watersheds.

The flood source area lay on sloping benchland 1,000 to 1,200 feet above the river. Overgrazing by cattle and deer was indicated by the sparse plant cover, terraces produced by livestock trampling, and brush browsed as high as animals could reach. The plant cover was annual weeds, remnants of perennial bunchgrasses, and scattered patches of brush. Approximately 75 percent of the soil surface was bare. Evidence of surface runoff and soil movement was seen in the water-washed appearance of the bare soil, soil freshly deposited on level spots and against the uphill sides of plant stems, and the presence of many rills and some gullies on steep slopes below the benchlands.

Even more spectacular damage occurred in 1923 and 1930 between Salt Lake City and Ogden, Utah. Floods generated on watershed land that had been severely overgrazed did more than $1 million property damage. Thousands of cubic yards of mud, together with rocks and boulders up to 300 tons in weight, were discharged from Parrish Creek and nearby mountain canyons onto farms and towns near Great Salt Lake. Bare soil on the watershed slopes showed gullies and soil pedestals and other signs of severe runoff and erosion. The canyons were deeply gouged.

Logging produces watershed disturbance which may lead to watershed damage through accelerated runoff and erosion. The signs of both actual and potential watershed damage from logging are easy to see. A logging operation in southwestern Idaho in 1951 furnished several examples.

The road system on the logging area was not adequately planned beforehand. Roads that could have been located elsewhere were built across very steep slopes. Consequently, the shallow soil mantle above slid into the road in several places, carrying standing timber with it. The great quantity of soil material that was excavated was spilled over the slopes below; lying loose and bare, this material was severely eroded by water running off the roads.

Disturbance of creek beds and ravine bottoms by skidding logs down them was common. The vegetation was torn out of the drainage bottoms, and the soil was gouged and loosened so that it could be washed away easily by stream flow.

Tractors skidded logs for long distances down very steep slopes, digging trenches that caught and concentrated the runoff from rains and melting snow. Since few waterbreaks were built in the skidtrails the runoff accumulated in flows that cut gullies in the trails.

Many stretches of road were built along the banks of perennial streams,

Area pictured at top of page once was covered with dense mixed hardwood forest like this one

Brush check dams give good temporary control of erosion in gully bottoms

and in this process stumps from the right-of-way, excavated material, and other debris were carelessly pushed into the channels and left there. By deflecting stream-flow this debris caused undercutting of road slopes and stream banks during periods of high runoff, and thereby increased erosion.

Burning the plant cover on mountain and foothill lands is a temporary type of watershed damage. It sets the stage for erosion, and sedimentation damages and reduced yields of water that are clear and usable. Ordinarily the cover reestablishes itself in a few years, but it may take much longer to bring runoff and erosion down to normal levels. Cases from the mountains of Idaho and California will illustrate some indicators of watershed damage in the downstream from burned areas.

In August 1949 a devastating fire swept portions of several watersheds tributary to the Salmon River, in Idaho. One, Huntz Gulch, was almost completely burned-over. The fire almost completely destroyed the cover of ponderosa fire, Douglasfir, brush and grass.

About two weeks after the fire, a rainstorm of approximately 0.5 inches struck the watershed. It produced a flood heavily charged with mud and rocks that temporarily dammed the Salmon River and shunted its flow against the bank opposite the mouth of Huntz Gulch. Most of the mud and rocks were gouged from the channel of Huntz Gulch. In the one storm, this small watershed produced an estimated 8,000 cubic yards of debris through channel erosion alone. The water that gouged the channel came from the steep, fire-denuded slopes which were riddled with rills and small gullies. Additional flood flows in Huntz Gulch may be expected during heavy rains until the plant cover is restored and the effects of burning are dissipated.

In California, great clouds of dust and ash were blown from the Matilija burn of 1932, near Santa Barbara, the Wheeler Springs burn of 1948 near Ventura, and the Green River burn of 1948 near Santa Ana. After the wind storms, and before rain fell on the bared slopes, measurements of unscorched plant roots found lying on top of the ground showed that from 1 to 2 inches of topsoil had been blown away. Some of the soil filtered into city homes several miles from the burn and some was deposited on sheltered slopes or in road cuts in the burn. A great deal of it was subsequently washed into stream channels and then downstream to reservoirs and water spreading grounds.

Mining activities tend to cause increased runoff, erosion, and other watershed damage. Moreover, the effects of mining can often be seen for many miles downstream. At the mines, waste earth and rock are dumped as tailings, and the watershed may be disturbed by roads and other construction. The mills dispose of crushed and digested waste as tailings that often contain chemicals toxic to plants. The smelters must get rid of tailings too, and in addition they must dispose of gases that also are toxic to plants.

Where mining damage has been done, the signs are plain. The mud that pollutes some of our rivers can be tracked back to its source in piles of trailings at the mines or mills, or mill waste discharged directly into streams. Hydraulic mining, which is still practiced in some localities,

Six Deadly Enemies of the Land

EROSION

Gullies and thin topsoil, illustrated here, are invariable products of erosion

FIRE

Rills left on steep slope. Fibrous roots beneath surface prevented deeper cutting

SKIDDING

When left like this, skid trails provide ideal setup for rivers of erosion

Ponderosa and sugar pines make dense cover on denuded slopes 14 years after they were planted

In 16 years willows planted as cuttings stabilized the gully at left. The gully at right was not treated

puts tremendous quantities of mud and gravel directly into streams, and sometimes causes serious problems of sedimentation.

Smelter fumes have caused very severe damage to watersheds at several places in the United States by killing the plant cover and exposing the soil to erosion. The vicinity of Shasta Dam in northern California and the Copper Basin in southeastern Tennessee are good places to see indicators of such watershed damage.

Road-building disturbs the soil. Damages arising from road building are most severe where the roads cross mountain and hill lands and are built with inadequate provision for drainage and soil stabilization.

Indicators of damage from road construction are obvious. Long, bare slopes of loose soil, and few, small culverts are indicators that erosion may occur. Gullies, fresh deposits of sediment, landslides and slumps, and gouged stream channels show that erosion has occurred. Gullying of unpaved roads adds to the sediment load of streams. Excavations for road cuts are a source of much loose earth and rocks that are pushed into the canyons during road construction. In some places these cuts are unstable and slide and slump for many years, occasionally blocking the road with tons of soil and rock material. Maintenance crews usually push this debris off the road onto the overcast and fill slopes, and from there it finds its way into the streams below.

Cultivation, grazing, logging, burning, mining, and road-building are the most common causes of watershed damage, but other activities that disturb the plant cover and the soil can have the same effects. For example, runoff from the roofs and pavements and erosion from the bare ground of new real estate subdivisions have sometimes caused serious flood damage downstream. Even the heavy trampling of ground by people in recreation areas has accelerated erosion.

Signs of watershed damage can be seen on the land if the observer knows what to look for. Muddy runoff, rills and gullies, erosion pedestals, and rapid sedimentation of streams and reservoirs are signs that damage has occurred. Deteriorated plant cover, newly bared ground, disturbed soil, and inadequate provisions for handling surface runoff are signs that damage may occur. We can keep much of the damage from taking place, however, if we recognize its signs and take steps to prevent accelerated runoff and soil erosion.

ROAD BUILDING

Roads are necessary. But builders should shore up outlets for erosion they create

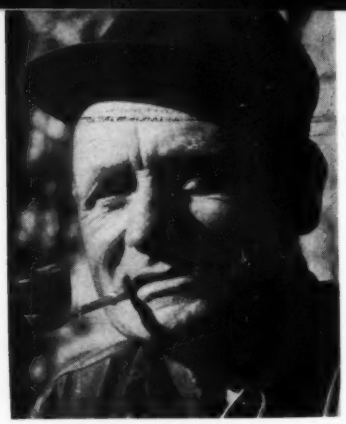
DREDGING

Top photo shows canyon bottom before dredging. Bottom, canyon after dredging

OVER-GRAZING

Steep slope just under rim of benchland showing terracing from livestock trails

Clyde Hall, an Indiana farmer, has solved the problem of making expensive trips to a distant lake. He dammed off a ravine and made his own



Mr. Hall

MAKE YOUR OWN LAKE

By ARCHIE H. SLATER

IT is very likely that you can turn some remote gully or ravine on your farmland into an attractive lake and private resort. Witness the gratifying experience of Clyde Hall, whose 120-acre farm is located in Huntington Township, Huntington county, Indiana. He found that it is fun to build a lake.

Mr. Hall and his family were in the habit of making an annual trip to Michigan, Wisconsin, Minnesota or northern Indiana for a week or two of fishing and relaxation in Mother Nature's wonderland which is always best exemplified by a lake or stream amid some unspoiled woodland. These trips were rather expensive, therefore the Halls began to consider the purchase of a lot, cabin, boat and dock at some popular lake in the north country. Investigation proved that such a set-up would involve several-thousand dollars.

About this time, Mr. Hall was stirring an idea around in the back of his mind. A non-arable ravine, serving as natural drainage, was lying worthlessly on the back of his farm. Several small springs trickled out of the hillsides of this scenic site, and a little brook trickled along the bottom. How much of a chore would it be to construct a dam across the lower end of this small valley? Would the ravine ever fill with water to a worthwhile level? How much would such a venture cost?

Deciding, with typical farmer's logic, that it would cost nothing to find out, he put his questions to a civil engineer with whom he was acquainted. The engineer sized up the situation with a professional eye and soon became enthusiastic about the enterprise. He offered to make the necessary survey for $25. Surprised, and more enthused than ever, Mr. Hall gave him the nod. The survey was completed in short order, showing the possibilities of a five-acre lake with an average depth of 15 feet and a maximum depth of 25 feet. The lake would be in an inverted L shape, with an ideal promontory north of the lake's bend to serve as a cabin site.

Before talking with a contractor, Mr. Hall reserved the thought that he would tackle the job if he could see his way through for not more than $2,000. His family was happily in accord with this. A beautiful, privately owned lake resort for a fraction of the cost of some lakesites they had investigated seemed too good to be true. Until Mr. Hall discussed the matter with the contractor, his plan was like a wishful dream.

The contractor listened to Clyde's proposal and accompanied him to the scene of tentative operations. He looked, he figured, he looked some more. What figure would be forthcoming? wondered Mr. Hall. He was prepared for a jolt — $3,000; $3,500; $4,000? Imagine his elation when the contractor made him a price of $1,122 for scooping eight feet out of the lower end of the ravine floor and constructing an earthen dam 442 feet long, 20 feet high, 100 feet wide at the base, tapering to 12 feet wide across the top!

The next major item was a drop drain to be placed near one end of the dam with a large conduit to run overflow water beneath the dam and into a continuation of the valley on the other side. Mr. Hall learned that your county agent will gladly supply you with explicit material, labor and method plans for this very thing. These plans enabled him to make an accurate estimate of the cost of this item. He accomplished the drain job for $578, working it in with the dam which was finally constructed with 31,680 yards of earth. The dream was becoming reality.

While the dam was being built, and before the ravine started to fill with water, it was necessary to grub out second-growth timber and brush to create a desirable lake bottom for fishing, boating and swimming. A large crew of Mr. Hall's fishing buddies was rounded up to help with the grubbing job. With the thought of future fishing and comradeship with Clyde to inspire them, they made the brush fly. Mrs. Hall topped off this activity by setting a thresher's table with all the tempting dishes available to the American farmwife. To her gratification, the hungry and happy crew of woodsmen did the feast full justice.

The job was completed in April, 1954. By June, the water had reached the exact level at all points predicted by the surveyor in the preembryonic days of the lake.

Your county agent and Soil Conservation Service representative are valuable assets to your community; Mr. Hall engaged his county agent's services to obtain fish with which to stock his new lake. The federal government encourages projects of this kind, for their value in preserving the water table, by providing stock fish. The county agent secured 500 bass and 500 bluegills for Mr. Hall's lake.

A few accessories are needed to complete the original dream. A retired school bus was purchased and outfitted for use as a cabin—most adequate. Fifty dollars were invested in a 16-foot rowboat. Mr. Hall employed the do-it-yourself principle in producing a boat dock, footbridge, picnic table, toilet, children's playground, well and diving board. Mrs. Hall has dubbed the place "Halls' Hideout."

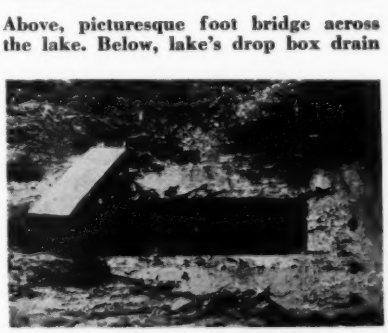
If you take advantage of a situation not unlike that of Clyde Hall's, consult an engineer, a contractor and your willing county agent or SCS representative. You will be doing yourself untold good, conservationwise, as well as providing yourself, your family and friends with an inexpensive recreation area to enjoy during any free hour or a week at a time.

In brief, it's fun to build a lake.

First step—constructing dam across practical point of ravine

Back, or dry side of 20-foot-high dam, which is 422 feet long

Above, picturesque foot bridge across the lake. Below, lake's drop box drain



The Wild Blackberry

(*From page* 25)

fully, for there must have been more than the two even at his time in the late eighteenth century.

In the United States there are probably not more than 15 or 20 varieties of wild blackberries that can be considered "good," that is, plentiful, large, sweet and with a pleasant flavor (although there are many more types found here from Florida north into Canada and west to Minnesota and Texas). Because of cross fertilization by honey bees and other insects, the different types are now quite difficult to identify exactly with the exception of *Rubus allegheniensis* and *Rubus frondosus.* Then there is *Rubus canadensis,* a thornless variety found at altitudes of 3000 to 4000 feet in the Appalachians from Georgia north to Canada. (Efforts to propagate the *canadensis* at lower altitudes seem to have met with little success so far.) My own favorite is the *alleghenien-sis,* found through the northern parts of the Appalachian Highland; the fruit is large, sweet and of good flavor and the canes are long and looping with a heavy crop of berries. We used to identify all blackberries as "wood berries" and "field berries," the latter having short canes which grew only in the open fields and bore smaller, seedier fruit with an acid taste. Perhaps that old, country distinction is still good enough for all of us except specialists or other scientifically minded persons. Also there are the vine or trailing types now so important in commercial cultivation, but in the northern states the fruit was always small, sour and seedy so that we never troubled to pick them. These we called "dewberries."

The blackberry, like every thing else, definitely has its place in Nature. The thick, rapid growth serves to prevent erosion, especially on side hills from which lumber has been clear cut and roads bulldozed in such a way that they serve as gutters to carry the rain water off rapidly, it provides shade for the seedlings of the hardwoods that later will crowd out the canes, the decaying leaves and briers add humus to the soil and it serves as shelter and food for countless song birds, game birds and many animals, large and small. From the quiet of a cottage porch in New York State I have watched ruffed grouse, ring necked pheasants, cat birds, robins, song sparrows and other birds taking the berries directly from the bushes or picking the fallen ones from the ground underneath. I have also seen deer, rabbits, chipmunks, red squirrels, gray squirrels and even deer mice devouring the berries greedily, as if they knew that they would last but a short time and that they should get them as soon as possible. In Pennsylvania I have seen wild turkeys and black bears collecting their share of the fruit. Wherever there are large patches of briers the number of game birds and animals seems to increase. Rabbits especially become more abundant when they have the protection of the bramble patches to dive into when pursued by hawks, owls, foxes, dogs and other larger animals who prey upon them. Many song birds like to nest either in the bushes or under them where they have both protection and a plentiful food supply.

In addition to using blackberries as food, many country people also used them as medicine. Blackberry cordial has been taken as a tonic and for certain specific physical disabilities. One typical "prescription" is: "Pick two pounds of blackberries just before they are ripe, while they are still red, crush them with one pound of sugar, add one half pint of brandy, simmer a few minutes, strain and bottle. Take as needed for dysentery and diarrhea." Blackberry wine was also used as a general tonic and for ceremonial occasions. Tea was made from the leaves and bark of new canes and taken as a blood purifier and tonic. Poultices made from the bruised roots of the plant were considered good for certain infections and diseases. Probably there are many other such recipes used in various parts of the country.

In many areas of the country apiarists consider the blackberry important to them, both as a source of pollen to feed the larvae and to some extent as a source of honey. While very little blackberry honey is marketed under that name, it is sold under another name—raspberry. According to several apiarists this raspberry honey is generally a mixture of blackberry and raspberry. Both the pollen and the nectar are of value in feeding our wild bees which are of such great importance in pollinating so many of our cultivated and wild crops. If you will observe a patch of blossoming blackberry briers for a half hour, you will see the flowers visited by honey bees, bumble bees, various wasps and many other insects.

Commercial cultivation of blackberries has not been as extensive as that of strawberries, raspberries and blueberries, possibly because of the comparative abundance of fine, large fruit of the wild forms in so many different sections of the country and because of the ease with which blackberries can be gathered in large quantities as compared with other wild berries. However, in recent years a rather large number—at least 40 — varieties of cultivated blackberries have been introduced, and acreage has been increasing in the Atlantic States as well as in Texas and the Pacific States. In 1940 there were some 27,000 acres under cultivation, and this acreage continues to increase.

Now, if you are going to try to pick a few wild blackberries this summer, a little advice may be in order. Be sure that you have good, heavy clothing as thorn resistant as possible. Short-sleeved shirts and shorts are definitely not in order regardless of the temperature unless you wish to return with a painful patchwork of deep scratches on the exposed parts of your body. Use a one or two-quart pail fastened to your belt so that both hands will be free for picking; you can empty the contents of the smaller pail into a larger one that you have deposited in the shade nearby. Watch your footing, for there will be brush piles, rocks and other obstacles over which you can fall if you are not careful. Be sure to look on the under side of every bush to find the largest and sweetest berries. Watch for yellow jackets and hornets on some of the very ripest berries — they enjoy a good drink of blackberry juice too and they resent being handled roughly. And first of all, *be sure to ask for permission to pick on any privately owned lands.* Treat the blackberry patches as you would any other private property. Happy picking—and eating!

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From harness to shut-off nozzle, the Dragon Fire Pump is designed from the firefighter's point of view . . . has *everything* he wants in a back-pack pump. And it boosts his efficiency by cutting down fatigue.

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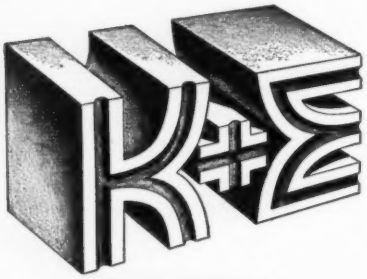

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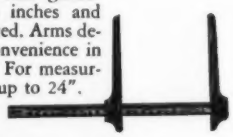

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Plunger is graduated in inches and tenths of an inch.

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Dr. Schenck Dead at 87

DR. Carl Alwin Schenck, 87, founder of the first school of forestry in the United States and for more than half a century one of the world's leading foresters, died May 17 in Lindenfels, Germany, after a long illness.

Born and educated in Germany, Schenck came to the United States in 1895 to take over the management of the woodlands of George W. Vanderbilt in North Carolina. This first effort to apply scientific forestry in American private woodlands management had been begun two years earlier by the first great American forester, Gifford Pinchot.

Among Schenck's more notable contributions to American forestry are founding the Biltmore Forest School; preparing a set of forestry textbooks (among the first written for American students); successfully experimenting in reforestation on the Biltmore Estate; and the invention of the now-famous "Biltmore Stick," a familiar measuring tool of foresters everywhere.

Forestry in America was just being born when Schenck arrived in this country. There were no schools of forestry here at that time and there was but a scant handful of European-trained professional foresters. Schenck, then only 27, was considered a tremendously important recruit for the cause of conservation, especially since he came armed with a Ph.D. degree in forestry from the University of Giessen and the recommendation of Sir Dietrich Brandis, then regarded as the world's leading professional forester.

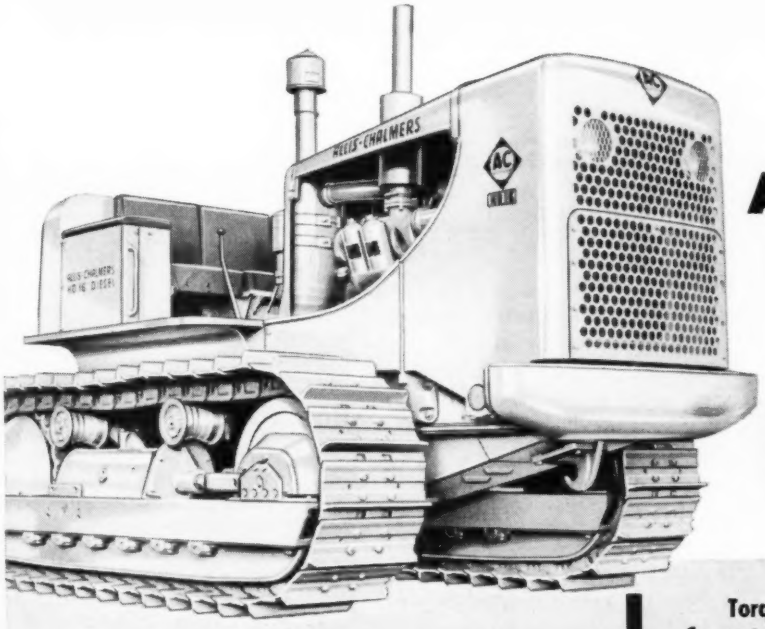
Schenck soon attracted the attention of young Americans interested in becoming foresters. From this enthusiastic corps of apprentices sprang the Biltmore Forest School which Schenck formally opened in 1898.

Dr. Carl Alwin Schenck

Dr. Schenck is survived by a sister, Mrs. Ollie vom Baur of Lindenfels. Relatives of Dr. Schenck in the United States include the families of Mr. Henry Schenck of Stamford, Connecticut, and of the late Mr. Ernest G. H. Schenck of Wilton, Connecticut; Mr. George W. Merck, Chairman of the Board of Merck & Company, Inc., Rahway, New Jersey; and Mr. Merck's sisters. Mrs. George W. Perkins, Mrs. Henry Wheeler, Jr., Mrs. Magda M. Sheldon, and the late Mrs. Snowden Henry.

R. W. Eschmeyer Dies

As *American Forests* went to press, it learned with deep regret of the death on May 22 of Dr. R. W. Eschmeyer, 50, Arlington, Va., executive vice president of the Sport Fishing Institute. The nationally known scientist, authority on fish conservation and author of children's books wrote articles for this magazine and was also the author of the popular Conservation Chart published by *American Forests* in April. Born in New Knoxville, Ohio, Dr. Eschmeyer graduated from Heidelberg College, Tiffin, Ohio in 1927. He received his master's degree and doctorate at the University of Michigan. For 12 years he was in charge of all fisheries research for the Tennessee Valley Authority. As executive vice president of the Sport Fishing Institute, he worked to improve sport fishing through better research and management and through more effective conservation education. He is survived by his wife, Ruth W. Eschmeyer, three children, two brothers, and three sisters.



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Set your sights on an HD-16! This big new tractor not only brings you *more* power for bigger jobs . . . it makes more effective use of horsepower, with a brand new Allis-Chalmers diesel engine and your choice of two new drives — the job-proved torque converter or the easy-shift standard transmission. Either way, the HD-16 brings you a new high in tractor-operator efficiency . . . a new high in work done under even the toughest conditions.

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JULY 5 TO JULY 16;
JULY 16 TO JULY 27
$215 from Missoula, Montana.
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JULY 29 TO AUGUST 8;
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AUGUST 12 AUGUST 22;
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AUGUST 10 TO AUGUST 20
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SEPTEMBER 7 TO SEPTEMBER 18
$220 from Santa Fe, New Mexico.
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Write or wire for detailed information, itineraries, and reservations.

THE AMERICAN FORESTRY ASSOCIATION

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Our Greatest Sponge

(*From page* 23)

Mr. Peterson further cited that the Missouri River each year on the average carries 376 tons of sediment per square mile; the Colorado River as a whole 1,724 tons but on the upper part—mostly in forest cover—108 tons; the Gila 690 tons; the Rio Grande 837 tons.

This clearly indicates the need for "controlling and cleaning up" the nation's rivers, Mr. Peterson said. Moreover, it can be done, he declared. In "my own state of Oregon the discharge of industrial and municipal waste had made the Willamette River unsuited for fish life and undesirable for other uses. State regulation, plus public education and responsible action by industry and local government, has cleaned up that river. So it *can* be done."

What do we need to assure an ample water supply for the future? "Facts, funds and facilities" said Mr. Lloyd. "Planning and carefully-worked out legislation to protect users as competition for water increases," said Mr. Jordan. Mr. Peterson, a former Oregon dairy farmer who talks like a forester, thought there was even more to it than increased planning, research and teamwork.

"Let us think first in terms of human resources," the assistant secretary said. "Let us together provide increasing and enlarging opportunity for the individual to apply his talents fully in remunerative and rewarding occupations. Let us seek an economy which is vigorous, dynamic, prosperous, and free, and where there is real opportunity."

Can this be achieved merely by opening the floodgates of the federal treasury? Mr. Peterson thinks not. The need, he believes, is for agriculture (and forestry) to become attuned with the high adaptability of our total economy.

"The real interest of agriculture (and forestry) lies in the broadest attainable markets and the highest obtainable incomes. As our farms and ranches are managed for this objective, there will develop both need and opportunity to use water effectively, while at the same time there will be maximum opportunity to contribute toward its conservation. Again, water is inseparable from land. The use and treatment of one reacts strongly upon the other."

AMONG OUR AUTHORS

Mr. Greenwood

Ramon Greenwood, (*Apostle of the Forest Congress*), former Little Rock newspaperman, recently was named American Forest Products Industries field manager for a five-state region embracing Tennessee, Arkansas, Missouri, Oklahoma and Kansas. A native of Warren, Arkansas and a journalism graduate of the University of Arkansas, Mr. Greenwood served as a staff writer for the *Arkansas Democrat* in Little Rock prior to joining AFPI. During World War II he served with the Air Corps.

Mr. Josephson

H. R. Josephson (*Progress on the Forest Survey*) began his career with the Forest Service in 1934 at the California Forest and Range Experiment Station. Several years later he became a member of the faculty of the School of Forestry, University of California. He served on the faculty there until World War II when he resigned to join the Air Force as an Air Intelligence Specialist and served in that capacity for three years. After his discharge from the Air Force in 1945 he was again employed by the Forest Service. In 1951 he was appointed Chief of the Division of Forest Economics Research, his present position.

Frank W. Heyward, Jr. (*Austin Cary, Yankee Peddler in Forestry*) is public relations director for the Gaylord Container Corp. of Bogaloosa, Louisiana.

Clark H. Gleason (author with Mr. Packer and Mr. Hockensmith of *Watershed Damage — Its Signs and Causes*) is a forester in the Division of Watershed Management Research, California Forest and Range Experiment Station of the U. S. Forest Service, at Berkeley. **Paul E. Packer** is a forester in the Division of Watershed Management Research, Intermountain Forest and Range Experiment Station of the U. S. Forest Service at Ogden, Utah. **Roy D. Hockensmith** is Director of Soil Survey Operations in the U. S. Soil Conservation Service.

Mr. Kauffman

The Future Book — A three-installment series on forestry progress in the South since AFA's Southern Forestry Educational Project of a quarter century ago will open in the August AMERICAN FORESTS and conclude in the October Annual Meeting number to be issued in conjunction with AFA's meeting in Jacksonville, Florida, October 3-6. Written by **Erle Kauffman,** former editor of AMERICAN FORESTS, the series will retrace the steps of AFA's "Dixie Crusaders" in four participating states and develop the advance of southern forestry since that time.

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Battle of the Bottomlands

(*From page* 16)

A typical meeting is one held at Coffeeville, a week prior to the hearing. Coffeeville is a small lumber town which would be reduced to ghost-town status by the high dam. The people were already aroused, but they wanted assurance that their story would be adequately told. They wanted a progress report on the timber surveys and economic studies that were being made under the auspices of the Association.

At that meeting, Kelley expressed the feeling of all the groups that were joined in the battle: "The people of southwest Alabama," he said, "are for river improvement, but not at the expense of their most valuable lands. Certainly the Corps of Engineers are capable of devising some plan that would not require the ruination of valuable areas. Since the dam is for no purpose other than a slightly cheaper transportation rate a high dam is not needed. We cannot progress the state or the country by taking our most valuable lands out of production. If we don't watch out, we will have all our river bottom lands out of production, and when that is done, progress in this state will be set back 50 years. The population of this country is on a constant increase, and each year we find more and more people depending on each acre of our productive land. By continuing to flood timber and agricultural acres, we are heading in the opposite direction of progress."

The Mayor of Coffeeville predicted that "the town would dry up and blow away." An owner who had purchased his lands over a long period, said, "I'll just be wiped out." A small sawmill operator would have to close his mill and when he did it would affect 87 families — 27 who work directly for him and another 60 with whom he has hauling contracts.

The Coffeeville story was about the same as that of other areas where dependency on the area to be flooded was real and vital.

Consequently, when the hearing was called in Jackson, the people were present either to tell their story direct to the Corps or to assure themselves that it was presented by their spokesmen.

The hearing started promptly, as scheduled, at 10 a.m. Col. Harold E. Bisbort, district engineer, and his staff, listened patiently and sympathetically to all sides of the question, and appeared to be somewhat amazed at the interest expressed by the landowners and others who stayed until 11 p.m. when the last one was heard.

Amazing also were the human interest stories that were disclosed: an owner of 275 acres who has sold timber at $25,000 during the past 10 years, has a reserve of cypress left, and who expects to produce another merchantable crop in 10 more years. Another owner, 220 acres, had an average timber harvest of from 150,000 to 200,000 board feet annually since 1927. Another has raised a family of seven children on 250 acres, half in timber and half in farm, and has put four of his children through college on the income from the land. Another owner's land supports 15 tenant families who would be displaced without reimbursement if the government bought the land. Witness after witness testified in the same vein—landowners and sawmill operators alike expressing their dependency upon each other and jointly on the land. Store keepers and other business men tied their livelihood directly and indirectly to the land which for the past 25 years has sustained a timber and agricultural economy.

Conservation agencies, both governmental and citizens groups, were on hand and eager to let the Corps know the effects of the dam on the economy and on wildlife habitat. The U. S. Fish and Wildlife Service, with representation from both the Washington, D. C., and Atlanta, Ga., offices, presented a detailed report on a special study it had made of the area. The U. S. Forest Service sent a forester to answer questions as to the condition and value of the bottomland hardwood area.

A statement by Governor James E. Folsom was introduced, opposing the high dam and its consequent inundation of timber and agricultural land. Similar opposition was expressed by Alabama's director of conservation, W. H. Drinkard, and its state forester, J. M. Stauffer.

The Alabama Wildlife Federation was represented by Claude Kelley, its president, and supported by Carl D. Shoemaker of the National Wildlife Federation, and numerous spokesmen for local wildlife groups.

Agricultural organizations reported on the loss to the farm economy. State Director of Extension P. O. Davis in a letter pointed out that the annual crop loss to result from the flooding of some 10,000 acres of bottomland farms would be in excess of $487,000. The state office of the Soil Conservation Service assembled data to show that the cost of putting upland soil — the only soil left to the farmers after flooding— in condition to produce comparable crop values would be more than $286,000.

The report of the Fish and Wildlife Service estimated the annual value of the forest growth in the affected area at the present time to be $1,004,400; and its value after the project is completed to be only $403,500. Wildlife resources now estimated at $128,000 would be reduced to $35,000. Although fishery resources would increase from $206,000 to $464,000, it was pointed out that Alabama already has abundant fisheries.

A study made by a firm of consulting foresters showed that the high dam would result in the inundation of 27,350 acres of bottomland hardwood timber, and in addition would adversely affect some 34,000 acres by raising water levels, isolating small pockets of timber in economically inaccessible islands and strips—a total of more than 61,000 acres.

An economic study of the hardwood industry showed that local users of hardwood for lumber and veneer derive about one-third of their timber from the affected area, and that the area contains about 26 percent of the good bottomland hardwoods available economically to the local industry. These are vital percentages. Elimination of one-third of the present source of supply and one-quarter of the economically accessible supply would result in disproportionately adverse effects on the industry and its dependents. It would mean complete elimination of a large part of the industry and drastic reductions and readjustments among those segments able to hang on. Initially it would mean

(*Turn to page* 48)

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DOW BRUSH KILLERS

Dow brush killers offer a positive means of removing hardwood competition to speed the growth of seedling conifers. Pine seedlings and other high-value timber species mature in a surprisingly short time after chemical control of overtopping hardwoods gives them adequate room, air, sunlight, soil nutrients and moisture.

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We invite inquiries from state and federal foresters, lumber companies and tree farmers. Dow sales and technical men are available to help assist in this new chemical method of hardwood control. THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Department, Midland, Michigan.

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6-55

Bottomlands

(*From page* 46)

flooding the mills with timber valued at from $6,000,000 to $9,000,000, creating a buyers' market with the landowners taking the losses resulting from a temporary oversupply. The industry is not geared to absorbing all this timber over a few years. Then, after the deluge would come the collapse.

These are just some of the highlights of the presentation. Added up they are formidable and frightening. The proposed high dam would jeopardize investments in lumber and plywood plants and facilities amounting to almost $12,000,000, would eliminate payrolls dependent on the project area alone of over $2,600,000 annually, and would have a decidedly adverse effect on total payments in payroll and services of close to $5,000,000. Landowners would lose agricultural lands valued at $487,000 in annual crop productivity and 60 percent of the value of timberlands estimated to be producing in excess of $1,000,000 in growth each year. Immediate annual losses would be $3,687,000 to the local economy.

The importance of the hearing at Jackson is that it injected into the appraisal the question of damage to the basic economy. Can a project be justified when the development of one resource—the river as a transportation artery—is done at the expense of another resource—the land?

As a consequence of the hearing, the Mobile District, Corps of Engineers, is restudying the whole proposal. Since no witness was opposed to river development, the Corps has what might be considered general approval of channel improvement. The question now before the Corps is how to effect such improvement as may be desirable without adversely affecting irreplaceable land resources and without upsetting established economies.

Relocation of the project, improvement of existing locks and dams, or the erection of two or more smaller structures that would keep the river within its present banks may be the answer. At any rate, a properly aroused citizenry has had an opportunity to bring to the attention of the Corps a set of new factors for consideration, and has been assured that these factors will be considered and given weight in revisions of the plan.

The Forest Survey

(*From page* 12)

tries, landowners, and others interested in the development of forest land and timber. Increasing efforts have therefore been exerted to strengthen cooperative Surveys so as to meet the needs of local users of resource information.

Cooperative contributions in 1954 totaled $375,000—about the average for the period 1946-54, but more than 15 times greater than prewar contributions. These local outlays for the Survey in recent years have been equivalent to nearly half the federal appropriations. Cooperation has been important in every state surveyed since 1946, but contributions have been notably substantial in California, Minnesota, Wisconsin, Michigan, Pennsylvania, New York, Maryland, Alabama, Louisiana, Georgia, North Carolina, and Florida.

Local participation has taken many forms, such as furnishing field personnel, purchase of aerial photographs, and cash transfers. State departments of forestry and conservation commissions have been among the leading contributors. In addition, direct cooperation by pulp and paper companies, lumber and power companies, and other industrial groups has been increasing rapidly, especially in the South. In Alabama, for example, 13 foresters from pulp and lumber companies were made available to work directly with Survey field crews. And similar industrial participation has been provided in other states such as Louisiana, Texas, and Georgia.

Local cooperation and participation in the Survey is being encouraged to the fullest extent possible to speed up the Forest Survey, and to provide the more detailed and costly statistics that will meet local as well as national needs for basic forest facts. The large contributions made to the Survey by many cooperators are tangible evidence of the value of the Forest Survey to many different groups.

Research to Improve Survey Methods

Over the past quarter of a century research in Survey techniques has helped greatly to reduce Survey costs and achieve greater reliability of data. The field-going timber cruiser has given way in part to the aerial

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photo interpreter and the statistician, and shanks' mare has been replaced in part by the jeep and the airplane.

Interpretation of aerial photographs to determine forest areas has become standard practice in all Survey units. Some progress has been made in estimating tree and stand volumes directly from aerial photographs. Development of new statistical sampling techniques also has helped increase the efficiency of surveys. Through such research and application of new techniques Survey costs have been significantly reduced —offsetting at least in part a 30 percent rise in salary and other expenses since 1946.

Changes in Survey techniques may be illustrated by citing experience in the Pacific Northwest where the early surveys were largely based upon compilations of existing cruises of lumber companies, public agencies, and various other timber owners. Except for field checking and cruising of limited areas by the Survey organization, these local estimates—which showed only the timber volumes then considered "merchantable"—provided the basic source of information for the Survey.

In recent years resurveys of uncut stands based upon aerial photos and statistical sampling methods have shown materially larger volumes than the previous estimates. In southwest Oregon, for example, the increase was 22 percent. These higher estimates primarily reflect lower utilization standards, which admit species and defective trees and logs that were excluded in the first survey. Estimates of commercial forest land areas also have been raised somewhat as a result of more intensive mapping and detailed interpretation of the aerial photographs.

Under the system currently used in the Pacific Northwest, forests are mapped in detail on photographs taken from airplanes, mapped areas are transferred to base maps, and the area of each type and stand class determined by placing a dot grid over the map and counting the number and proportion of dots falling in each forest class. Field plots are then selected at random in each mapped stand-size class and visited by field crews to obtain volume and growth data. On these field plots trees are tallied by species, diameter, height, form class, log grade, and percent of cull. Increment cores are taken from sample trees to determine rates of diameter growth. Trees that have recently died are tallied to provide estimates of mortality from natural causes such as fire, insects, disease, and wind.

From such plot measurements estimates are then derived for each class of forest land, showing net stand volumes in board feet and cubic feet, volumes by log grades, and annual timber growth and mortality. The volume of timber cut annually is determined from industry surveys of log production, other local surveys of fuelwood production and output of minor products, and studies of logging areas to determine the volume of unused logging residues.

In the case of the first Survey made in the South during the 1930's, lines were run 10 miles apart, with one-fifth-acre sample plots measured at regular intervals of one-eighth mile along the lines. Following the compass through southern swamps in a country notorious for heat, snakes, ticks, and chiggers, was indeed a job for men of stamina.

Today's procedures in the South, like those in the Pacific Northwest, make use of aerial photos to distinguish forest from nonforest land. A dot grid is placed over the aerial photos and the area under each dot carefully classified to determine the proportion of forest land in the area being surveyed. Points at the intersections of a 3-mile grid are then selected, located on photos, and if classified as "forest" plots are visited in the field using the easiest possible combination of car and foot travel. Plot measurements and other procedures are similar to those described above for the Pacific Northwest. In recent years southern crews have also measured stumps to provide an estimate of the total timber cut during the 3 years immediately preceding plot examination. All field data are placed on IBM cards and final statistics derived by machine sorting and tabulation.

In other regions variations on these methods are used depending upon local forest conditions, feasibility of travel to field plots, local importance of cover maps, and other factors. In California, for example, the area of each class of forest cover has been determined by measurements of line transects plotted on aerial photos and cover type maps. In the northern Rocky Mountains and Lake States sample sections or forties have been intensively mapped by use of aerial photographs and field examination, and the proportions of different stand classes and types determined by dot counts of the sample

areas. In the Northeast and Central States proportions of each class of forest land have been estimated by intensive aerial photo interpretation of a large number of "photo" plots. Most field travel for checking photos and collecting field plot data is still by car and foot. But, airplanes have been successfully used in the Rocky Mountains and Alaska for checking type maps and photo classifications. In Maine crews have been transported to remote lakes by pontoon planes, and boats have been used in southern swamps to reach field plots.

In all regions Survey field plots are carefully marked on the ground so that plots can be relocated for future measurements. Studies are being made to determine the feasibility of "continuous inventories" based upon periodic remeasurements of a relatively small number of these previously located sample plots. Other research in techniques is conducted by the Forest Survey organization to appraise the cost and accuracy of new or modified survey methods. In spite of the improvements that have been achieved in statistical sampling and photo interpretation, additional research can undoubtedly lead to new techniques for making better surveys at lower costs.

Future Survey Needs

In its Program for American Forestry, The American Forestry Association recently recommended:

"Continuation and acceleration of the forest survey; greater participation by states and local industries: review of the nation's forestry situation at periodic intervals; development of new and improved survey techniques for greater accuracy and lower cost."

The Forest Research Advisory Committee of the Department of Agriculture and numerous other groups and individuals have similarly urged a more adequate program of forest surveys.

The wide variations and divergent trends in forest conditions in the United States, together with growing pressures on resources, emphasize the need for acceleration of the Survey (1) to complete coverage of all areas not previously inventoried and (2) to maintain the Survey up-to-date by periodic resurveys of the commercial forest areas. An initial Survey in the Rocky Mountain area and in southeastern Alaska is particularly needed to guide the expansion of industry that is taking place in these regions. A minimum long-term Forest Survey program also should provide for resurveys of the 470 million acres of commercial forest land at intervals of from 8 to 15 years for given states. This cycle will depend upon such factors as the importance and character of timber stands, rates of timber cutting, trends in industrial expansion, and current and prospective timber growth.

In the years ahead it is almost certain that timber requirements in the U. S. will continue to increase.

As population grows and Gross National Product rises, total raw-material requirements for construction, industrial, and consumer uses likewise will increase. Timber products have lost some ground to competing materials in the "raw-material mix," but it is likely, nevertheless, that total consumption of timber products will rise substantially over the next few decades.

An expanding economy will in turn call for further expansions of forestry programs to supply the nation's demands for lumber, wood pulp, and other products. There will thus be continuing need for a nationwide Forest Survey to guide the business planning of forest industries and timber owners, and to provide a factual basis for the forestry programs of the various forestry agencies.

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Austin Cary

(*From page* 29)

concern was expressed by some sources that frequent fires might deplete the soil. In his June 2, 1926 letter to Extension Forester Tryon, already referred to, Cary wrote that he had obtained the viewpoint of Dr. Curtis F. Marbut some years ago on this subject. He commented: "As to the embodiment of forest litter in the soil as humus, Professor Marbut thinks there is little to that in whatever climatic conditions. In the South the carbon and nitrogen burn out, dissipate into the air; the humus mixed in with the mineral soil he considers is the product of the roots, both of the trees and of grasses. This has looked reasonable to me, too; other sections seem to favor his idea. Mineral elements in the litter he says do return to the soil beneath or mainly so, but more rapidly out of ashes than unburned litter. Taking him as authority, therefore, the mulching effect of the litter constitutes its value to southern forest growth." After intensive study of the effect of fire on the soil made by the writer, 1930-1937, while employed by the Southern Forest Experiment Station, Lake City, Fla., the same conclusion was drawn.

Viewpoints on Specific Forestry Matters

Cary had no sympathy for either federal regulation or land acquisition. In 1924 he complimented D. T. Mason for an article on private forestry in the West. After stating that he had shared Mason's views for 30 years, Cary wrote, "I was the first American to serve as forester for a business concern. (In 1898 Cary became Forester for the Berlin Mills Company, Berlin, N. H., later for The Brown Company. He served in this capacity for six years.) Probably it is not known to you that the first note of optimism after Graves' statement in 1918 that set the present agitation going, in which he pointed things about as dark as possible, was an article I wrote for the AMERICAN LUMBERMAN and is in its issue of November 11 of the year named. This office, at the time I wrote that, was full of the buzz of regulation."

He concluded this letter by writing, "We're winning out—the truly sane, cooperative men."

Cary emphatically stated his opposition to federal acquisition in a memo to the Washington office of the Forest Service in 1932 as follows, "I do not myself sympathize with the idea of extensive acquisition of forest land in the South by the national government, outside of truly protective areas. As for the states' doing a similar thing, I see no present tendency toward it and would not myself incline to force the issue. Opportunity for that, in my opinion, will long remain, and at the same time improvement should take place in the financial and other equipment of the states for carrying on such undertakings. Timber growing as business makes stronger appeal in our southern states than in any other part of the world as far as I know. I'm for giving freedom and opportunity to it."

Cary's Interpretation of His Job

When asked about Forest Service policy regarding cooperation with private interests, Cary prepared the following answer which might well serve as a creed for public forestry agencies, "The Forest Service as far as I know is not hampered by rigid lines of policy or limitation laid down. In fact, I would say its characteristic attitude was eagerness to be of service through the acquisition of sound information, its dissemination among the people, and the promotion of appropriate and effective action, both private and public, in harmony with the facts learned."

In a letter to a Mississippi lumberman Cary explained his own service to the public as follows, "Sometimes a man who has been over a good

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deal of country can see a point in another man's operation that can be changed to his advantage, or some useful point about markets and relations to other parts of the country can be conveyed at the time or later. In the forestry line direct, I believe I can see that a good many men are overlooking opportunities because they don't understand the matter of timber growth—some young stands in this region are growing at an amazing rate, will change into merchantable size quicker than men think, and they miss an opportunity of not buying land that has them. Of course anything I could do to promote fire protection in the country, or the moderate taxation which is essential to treating timber right is always done most gladly."

Speaking to a group in Florida, Cary made the following remarks: ". . . This much I generally try to do on occasions when I have to talk before people in the South—transfer their thought in part from immediate surroundings so familiar that they can hardly be viewed in any other than the present guise, take my hearers away to other regions, especially those further along in their forestry development—not to present the ideal altogether, but to furnish courage and guidance on the basis of solid progress actually attained."

To Rudolph Weyerhaeuser, Cloquet, Minn., Cary wrote, "Perhaps, however, I shall do well to explain in a few words the attitude of the Forest Service toward lumbermen and landowners, as to some extent I represent it. We expect a large share of the timber of the future to be produced under business conditions and are entirely willing that it should be so. Conditions favorable to timber growing are the ones that will be so employed; the local conditions are of that nature. We do not expect men to move in this direction until they can see something for themselves in it, either immediate or in the future. At the same time we believe that often times men, trained along other lines and unfamiliar with some facts that bear on the matter, fail to act promptly enough for their own good or even neglect opportunity altogether. When that is the case, the loss involved is public as well as private.

For these reasons this cooperative service, so-called, is maintained."

When Austin Cary died in 1936, on the Campus of the University of Florida, the forestry profession lost a great leader.

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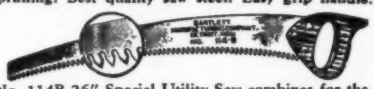

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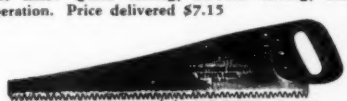

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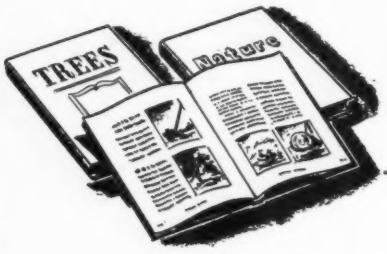

Reading About CONSERVATION

By ARTHUR B. MEYER

MORE than 35 million people will visit the national forests this year. Most of them will go for recreation in the out-of-doors. In doing so they may note that timber is being harvested, that livestock graze these lands, that there is wildlife around. The more observant may relate good fishing streams and protected watersheds. And yet, very few of these visitors will have had an opportunity to grasp the total extent of our publicly owned forests, or to appreciate the many ways in which they serve the public. Nor is this surprising. The national forests total 180 million acres in 148 different units in 38 states, Alaska, and Puerto Rico. A big domain to review. These forests serve in ways tangible and financial; in ways that are measurable, but without dollar values; and in other ways that may be compared only by emotional and spiritual yardsticks.

A new and timely book, *Our National Forests,* by Bernard Frank (Univ. of Oklahoma Press, 238 pp., $4), will do much to acquaint the public with the extent and value of the magnificent property they own in the national forests of the United States. These 148 forests lie mostly in the higher and rougher lands, remote from large population centers. In the continental U.S. "They furnish a large part of the water supplies for more than half the western irrigation farms and much of that used by the water-power plants and cities. . . They yield one-tenth of the nation's annual cut of sawtimber, and some eight percent of the nation's sheep and cattle graze on them part of each year." They also contain "other resources of a non-commercial character whose value to the public far outweighs that which could be derived from commercial purposes exclusively."

Frank tells how the national forest system came into being. He then discusses in detail its contributions to our society under the heading "Profit, Pleasure – and Something More." In this section he also discusses conflicting interests that have threatened the forests, and describes the way in which research is leading toward increasing benefits from forest lands.

In a following section, national forests in various geographic regions are described briefly and their role in the life of their region illustrated.

Appropriately, in this year that marks the 50th anniversary of the U. S. Forest Service, the organization, *esprit de corps,* and day by day work of that body of public servants is described. In this it is possible to sense one of the more-than-one reasons why the national forests constitute a national possession of great value. Those who manage and protect these forests do so with energy, devotion to duty, and the aim of making the forests a productive and useful part of the economic and social life of the region in which they are located.

A last brief section discusses some current issues facing the national forests and some long-range problems that need solution. The latter, the author characterizes as the question of "how the national forests can produce a balanced variety of abundant benefits to the most people."

In the author's view—one held by

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many other people—the greatest value of the publicly owned national forests lies in their ability to produce a balanced variety of benefits. It is interesting to trace the evolution of public acceptance of this viewpoint from the days when the forests were called "reserves"—and actually were. They were hoarded supplies of wood and grass for future use. Early leaders recognized their value from the vital standpoint of water, but most people did not think of them in that light. Later they came to do so, and to think of the forests as growers of timber and grass rather than reserved supplies of them.

Currently we look to the national forests to give us other things than timber, grass, and water. An expanding population with more and more leisure time is turning to the out-of-doors in a natural reaction to our increasingly urban existence. Consider 35 million people seeking outdoor recreation or a chance to let nature do a little re-creating for them. Hunters and fishermen find in the national forests not only the quarry they seek but land where they have a right to hunt and fish. Picnickers, hikers, campers, and those who search for the solitude of untouched wilderness turn to the public lands of the forests, lands which still must produce timber, grass, and water. Out of these varying and sometimes conflicting demands and uses has risen the concept of multiple-use of the forests, based on their capacity to give us many things. We do not expect each acre of land to produce all crops and benefits in a stated proportion, but we do expect the combined acres of a forest to do so. How best to "produce a balanced variety of abundant benefits" becomes the chief question.

* * *

In Bernard Frank's book he stresses the multiple benefits from forests, including those of an intangible, intellectual or spiritual, nature. In *The Way of the Wilderness* Martha Reben (Crowell Co., 276 pp., $3.50) gives a personal meaning to those spiritual values.

Miss Reben was afflicted with tuberculosis and left the city life to take to the woods for her health. Although there is a surplus of books about people who went to live in the woods for a time and write of their experiences, it is safe to say that Miss Reben's possesses a sincerity and a realness not typical of many of them. Her book is a simple, straight-forward account of a young woman who went to nature to seek physical health and found more than that. It contains a story, a story of how she found herself and developed an outlook on life, of her attraction and love for a young man and her grief on his untimely, accidental death. But the reader is able to evaluate the real significance of the book and what it has to say by being able to understand how and why Miss Reben was able in the end to accept life as it came to her.

The Way of the Wilderness is deceptively reportorial. It doesn't seem to be "deep." Miss Reben tells, usually interestingly, sometimes a little tiresomely, of her day by day experiences, observations, and feelings, during a year spent first in the outskirts of an Adirondack village and then in a camp on a lake. The reader senses the transformation of a city-bred girl into a lover of nature. In the course of reading the book he may sometimes feel that Miss Reben is a little too sentimental in her regard of chipmunks, raccoons, field mice, and wasps whose every move she diligently reports. But by the time he ends the book he will appreciate that the young lady has learned a great deal and has offered the reader a chance to learn along with her.

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The Unconquerable Gypsy

(*From page 27*)

Connecticut, was sent into a badly infested area as a Field Expert in 1891. Explaining the hardships endured by the people living in dwellings near badly infested areas, he says, "Caterpillars leaving the nearly stripped trees may cover the outer walls of houses, and the housewife find herself compelled to sweep the pests from the front steps before a visitor enters the dwelling. The crawlers make their way into the house and may be found on walls, ceilings, clothing, in closets, and even in beds. These were common experiences in the early Gypsy moth days and are likely to be repeated in newly infested sections, especially where there are nearby oak or apple trees."

A bad situation grew steadily worse. Successful methods of combatting the insect were unknown, and the fight progressed haphazardly until 1890. At that time, conditions were such that the state of Massachusetts was forced to appropriate $25,000 in an attempt to stamp out the greedy caterpillars.

The efforts of extermination went forward, agonizingly slow, but ever toward the desired goal, and in 1897, Professor C. H. Fernald, then Massachusetts State Advisor on Gypsy Moth Control, estimated the pest could be banished from American woodlands at a cost of $1,575,000. This cost, he advised, should be extended over a fifteen-year period in order to lessen the burden to be placed on the taxpayers, but no definite measures were adopted at that time. The professor's excellent plan was pigeonholed, then forgotten completely.

Control work of a kind continued, and more effective methods of treatment were finally developed. Better results followed naturally. Two summers passed with little damage to wooded areas which could be attributed to the hungry caterpillars. Actually, few living specimens of the infamous moth could be found in areas formerly "alive" with them. So, despite the protests and the advice of experts, in February 1900, the Massachusetts Legislature made a decision they and their descendants lived to regret. The Gypsy moth control project was abandoned.

Unmolested, the insect did "thrive and multiply." Again, the public was lulled into a state of false security. No serious infestations were reported until the 5th summer following abandonment of control measures. For a second time then, the inhabitants of all the old infested areas plus several new ones, knew the full force of a Gypsy moth attack. Trees in many exclusive residential sections were denuded and thousands of acres of valuable woodland ruined. That year Massachusetts was again forced to appropriate money for control work.

The Gypsy moth had been given five years of grace — five years in which to re-establish itself and prepare for a war which was to last— well, who knows for how long! It is not yet ended. The insect made good use of the allotted time. It no longer lingered in one state. Pioneers, by the hundreds, migrated to adjoining states. When the control work had been dropped in 1900, the known area of infestation was about 359 square miles. During those ruinous five years, the Gypsy moth penetrated to an area of 2,224 square miles in Massachusetts, and colonized extensive sections of Maine, New Hampshire and Rhode Island.

To prevent further spread of the pest, the federal government stepped in and in 1906, an appropriation for control purposes was approved by Congress. The Secretary of Agriculture was instructed to aid the stricken states in every way possible. This measure was designed to be another of the famous "too little, too lates." Regarding this period, the U. S. Department of Agriculture says, "The insect had increased to such enormous numbers and had spread so rapidly that the utmost efforts of the federal and state forces were only able to apply relief measures in the badly infested residential sections and slightly retard the continued spread of the pest."

In spite of the federal and state efforts, the Gypsy moth was not to be denied. *It continued to spread.* Every year, the area of defoliation increased. The list of states infested sectionally grew rapidly. Vermont, New York, New Jersey, and Ohio were added to those already named.

In order to cope with the situation, representatives from all infested states, the Dominion of Canada and the U. S. Department of Agriculture held a conference in Albany, New York, on December 26, 1922. A resolution was adopted there advocating the raising of sufficient funds by the interested states and the federal government to "continue and strengthen control methods in the infested areas, to do necessary scouting for the discovery and destruction of border infestations, to determine the location of the most practical place for a control zone, to take necessary steps to make control therein effective, and to destroy all infestations in the west of said zone."

The idea behind the control zone was to keep the insect in a known and confined area where control work could be carried on more effectively, and where it would be possible to keep the insect from passing through or beyond the zone. Such a method is valuable only as long as the zone holds. It has, so far, with few exceptions. In the occasional zone breaks, the new colonies have been located and stamped out.

The female Gypsy, although she has well-developed wings, seldom flies, and then but feebly. How then, if the mother is confined to a limited area, can the insect spread so rapidly?

There are several methods of transportation the wily creatures use to good advantage. In the first place, peculiarly enough, the mother who has wings is not an effectual flier but her offspring, with no wings, takes to the air with ease.

There are four stages in the life history of the Gypsy moth: the egg, the larva or caterpillar, the pupa or resting stage, and the adult moth. As soon as warm weather arrives each year, usually the early part of May, the eggs deposited by the adult female during July and August of the previous year, begin to hatch.

The new-born larvae are covered with a coat of silken "hair" so fluffy and down-like the wind can easily pick up the tiny creatures and whisk them away to new settlements. Then too, if it were not possible for the wind to blow them loose from their birth places, it could and does break the shimmering silky strands the young caterpillars spin to lower themselves from branch to branch, leaf to leaf, or wherever they want to go and cannot find suitable crawling surface. Thus, without wings,

young generations of Gypsies are airborne, and manage to travel distances never equalled by their mothers.

According to the Department of Agriculture, "Larvae have been captured on screens 20 miles distant from the nearest known infestation, and one larva has been taken on a screen attached to an airplane at a height of about 1800 or 1900 feet above the ground (2,000 feet above sea level). The height to which they may be carried varies from day to day and may greatly exceed 2,000 feet. Once larvae have reached such heights, they may encounter cross currents of air and be blown in the direction opposite to which surface winds are blowing."

During the latter part of June or the first part of July, the larvae mature and begin looking for shady places in which to pupate or transform into moths. They remain in the pupal stage from ten to fourteen days, emerging as adult moths.

At that time, the egg-depositing period begins. Eggs are yellowish in color, almost globular and measure approximately 1/20 of an inch through. The female lays her egg masses in clusters ranging from 200 to approximately 1,000. The average is about 400. Egg clusters are covered with "hairs" from the mother's body and look like a piece of reddish-brown felt. Tree trunks and stone walls are favorite egg-laying sites. They are also found under loose bark and leaves. Egg clusters have been found on loads of lumber and occasionally, on moving objects—trains, trucks, and automobiles.

With the depositing of her eggs, the female Gypsy has accomplished her mission in life, and dies. Adult moths, both male and female, take no food.

Early in the Gypsy moth campaign, efforts were made to curb shipments of any commodities that might unwittingly carry the insect to uninfested areas. The plant quarantine law was enacted by Congress to put teeth in the control work, and since October 1921, all shipments from Gypsy moth infested areas have been inspected and rigidly controlled by federal quarantine.

One of the main reasons for the Gypsy moth spreading so rapidly was that it had no natural enemies in this hemisphere. Science came to the rescue by sending abroad to the native land of the Gypsy to find a natural enemy to prey on the unwelcome stranger. A large quantity of parasitic material was received from Japan, and more from Europe. Some proved of no value. Others remained to become established and destroy large numbers of the moth, caterpillars and pupae.

Foremost among the natural enemies of the Gypsy moth caterpillar is the beetle *Calosoma sycophanta,* L. Calosoma is a beautiful beetle. Not quite an inch long, it has green and violet wing covers and a body marked with blue, gold, green and copper, all blended together to produce a shimmering, metallic coat. The agile immigrant does not spend all of its time on the ground, either. It is adept at climbing and can reach the fat, soft-bodied caterpillars with ease even though they are hidden in the tops of tall trees. During the course of its lifetime, one Calosoma "consumes the equal of 300 fully grown" Gypsy moth caterpillars. Little wonder the American public welcomed the little foreigner. With their hungry, chewing little mouths and their caterpillar-in-particular appetite, Calosoma beetles have proved able allies in the fight to conquer the Gypsy.

The tactics of a beetle attacking a caterpillar were described to me by an entomologist who watched a

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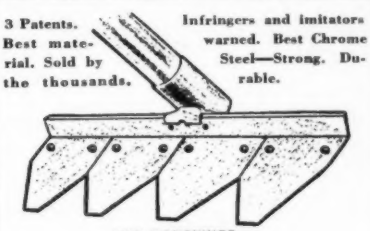

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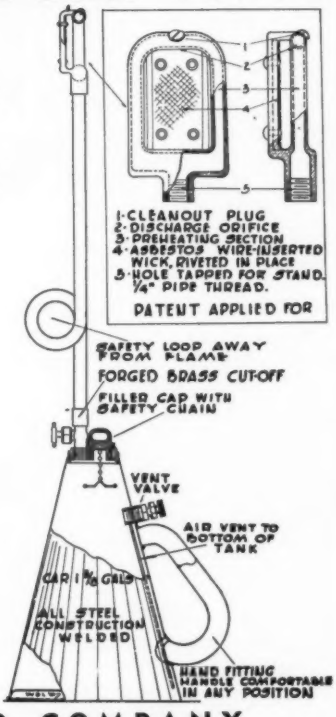
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"red-hot" battle. The beetle seems never to doubt the outcome even before his first rush is made. He doesn't appear too interested—more like it is just another job to do. He proceeds methodically to wear his victim down by darting in, striking always at the rear part of the caterpillar. At first, the caterpillar fights back, furiously lashing the fore part of its body back and forth in an effort to land a telling blow. The beetle continues his attack and almost every time he rushes in, another hole appears in the caterpillar's body. The victim's movements become slower and slower and finally, cease. The beetle buries his mouth deep in the fluids oozing from the broken larva's body and does not come up until only the empty skin remains.

Natural enemies have, of course, helped to stem the tide, but they have not breached the gap. A ceaseless warfare against the Gypsy moth must be maintained to keep infestations down. Since it was in the interests of science the Gypsy moth was introduced into this country, it is gratifying to know that science is having the final say in eliminating the unwanted pest. That is, science is putting forth every effort in this all-out battle and there can be little doubt regarding the final outcome no matter how long it takes.

Partial control of the Gypsy moth has been made possible by the development of new methods of treatment utilizing new types of equipment, and accomplished through organized cooperative programs. The cost has been far less than previous control programs, and there has been no permanent injury to domestic animals nor to wildlife.

From the beginning of the Gypsy moth seige, science has struggled valiantly for control. Each year more modern and better equipment for spraying and distributing more effective kinds of insecticides has been designed. When science developed DDT, a powerful weapon for combatting all insect pests was placed in the hands of Mankind. In many cases, single applications of this powerful insecticide can control the Gypsy moth and many other kinds of objectionable insects.

During the last few years, a new kind of mist blower has been designed. It operates from the ground and is used when conditions permit. This blower applies DDT to trees and other host plants in residential areas and along highways. One of the new mist blowers can treat, in

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one season, about ten times the area sprayed with a conventional type hydraulic sprayer. The average cost for spraying is sixty cents per acre.

Aircraft have attained an important position in insect pest control in recent years. When properly equipped and operated for this purpose, airplanes are versatile and efficient, and have marked advantages over ground equipment. Extensive outbreaks of insects may be treated rapidly, without disturbing crops, and insecticides may be applied when the ground is too wet to allow the operation of ground equipment. Aircraft is the only practical solution to the problem of how to apply insecticides effectively to great areas since such tracts are frequently inaccessible to ground crews. Even small airplanes can treat about 250 acres of woodland per hour.

Sex attractant traps have played no minor part in science's quest to conquer the Gypsy moth. Many years ago, it was discovered that a fluid in the sex glands of virgin female Gypsy moths could be extracted and used with benzol to lure adult male moths into a tanglefoot trap.

After a great deal of experimentation, it was decided to use sex attractant traps in surveys to determine the presence or absence of the Gypsy moth, on a "try-out" basis. Large scale use of the traps was started during the summer of 1942 when 7,300 traps were used to survey 2,950,000 acres in New York, New Jersey and Pennsylvania.

The traps were a success and trapping programs continued annually at a high rate until in the summer of 1950, approximately 19,600 traps were in use surveying 7,193,600 acres.

The most satisfactory traps are about four inches in diameter and seven inches long. Benzol, containing the sex attractant, is placed on a corrugated paper cartridge which is secured inside the metal cylinder by a wire which is also used to attach the trap to the trunk or a branch of a tree. Traps are generally placed about a mile apart. The attractant range seems to be about a half-mile radius from the trap. Territory considered likely to be infested is normally trapped on a gridiron pattern so full coverage of the area involved is provided. The scent dispersed into the atmosphere from the trap is carried by even slight breezes and picked up by adult Gypsy moth males.

To obtain the sex attractant, large numbers of Gypsy moth pupae are collected from sections where the invasion has reached peak proportions. The pupae are placed in traps and held until the moths emerge. For the first and last 24 hours of their lives, the virgin female moths are placed in "aging" boxes and stored in a cool room. When this 24-hour cycle is ended, the last three or four segments of the moths' bodies are clipped off into benzol. The moths are destroyed then in kerosene. The benzol, containing the moth tips, is transported to the U. S. Bureau of Entomology and Plant Quarantine in Beltsville, Maryland, where it is chemically processed to stabilize the sex attractant.

The ultimate goal of the federal-state control program is the complete eradication of the Gypsy moth from North American shores. The Bureau of Entomology outlines five objectives of the program:

First, eradicate the pest in Pennsylvania.

Second, eliminate it west of the Hudson River in New York State, and finally, from the state entirely.

Third, apply control and eradication measures against the Gypsy moth in western New England to prevent it from spreading westward.

Fourth, by enforcing prescribed quarantine regulations, prevent long-distance spread of either the Gypsy moth or the brown tail moth into areas cleared of the pests by eradication measures, and into all uninfested areas.

Fifth, encourage general use of new methods of control throughout infested portions of New England by demonstrating these methods with airplanes, mist blowers, improved insecticides, and modern surveys.

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Tree That Walks

(*From page* 13)

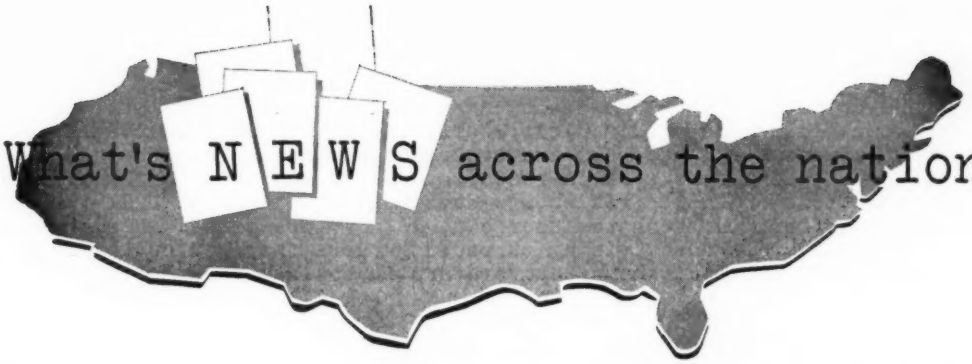
where their "walking" roots form perching sites for mangrove hoppers. These are strange little fish that seem to have forsaken the water to climb out upon the wet roots to sun themselves in an astounding and unfish-like fashion.

The mangrove, by its unique mode of growth, tends to expand the shores that it borders. It is continually putting out fresh roots that arch outward and downward to take hold of the bottom.

There are about sixty kinds of true mangroves but only one species is found in southern Florida, the red mangrove named *Rhizophora mangle* L. This same species is widely-distributed over the world. It produces small, nodding flowers of pale yellow and these in turn give rise to small, leathery, brown fruit. This fruit contains a seed which soon germinates, sending out a "root" or radicle about ten inches in length. These radicles are torpedo-like "roots" and they become mature after about four months while still suspended from the "parent" fruit. They are shaped like loaded darts with their thickest diameters near the bottoms which are pointed. These dart-like "roots" now drop from the plant one by one and plummet into the mud where they usually penetrate far enough to remain vertical in spite of the movement of tides. Each one then sends roots out of its lower portion which anchors it securely, and soon a mass of leaflets emerges from the top. And, thus, a new mangrove tree is on its way.

But suppose the water beneath the suspended radicle is too deep for it to reach and penetrate the mud or sand; what happens then? This, too, nature has taken care of.

When the root "spears" drop into deep water they merely float on the surface in a horizontal position and ocean currents may carry them away, perhaps even to other continents. This, no doubt, accounts for their wide distribution. As they float about, the center of gravity slowly shifts by some means so that the bottom end becomes heavier and slowly the radicle swings to a vertical position and perhaps becomes imbedded in the mud or sand of another shore to start a new colony of mangroves.



A NEW DEVELOPMENT IN FORESTRY WORKSHOPS—THE LONG WEEKEND—WAS GIVEN A TRY last month with excellent results by G. W. E. Nicholson, executive vice president, of the Union Bag & Paper Corporation. Arriving at Savannah, Georgia, on Friday morning, approximately 20 visitors ranging from college deans to conservation association directors and editors were first taken on a tour of the plant (six paper machines produce 1800 tons a day) and the one-year-old demonstration forest and research center. Guests were next transported to the firm's attractive Palmetto Bluff Lodge where for the next two days they combined intensive discussion with deep sea fishing and other recreational activities.

WITH THE COLLEGES, FEDERAL AND PRIVATE FORESTRY AND ASSOCIATIONS WELL REPRESENTED, the morning and evening workshop sessions were lively, informative, and provided a fine medium for exchange of ideas. Efficiency in woods operations was stressed with guests agreeing that while stumpage costs will continue to rise that transportation and labor costs (which now represent about 50 percent of the cost of the paper-making operation) can be materially reduced by more intensive growth of fibre close to the scene of operations and greater mechanization in the woods. That Union Bag is endeavoring to enforce its own motto ("More and more and more (wood) for less, and less and less (cost)") is evidenced by the fact that the plant now owns 900,000 acres of land. Between 12 and 15 million trees will be planted on these acres in the next few years. Eight hundred miles of roads have been constructed with 500 more planned. These holdings have been broken down into nine forests of 100,000 acres each. Each forest has three working circles and there are 30 "compartments" in each circle of approximately 1,000 acres.

CRIPPLING FIRES THAT HAVE SWEPT THE SOUTH IN RECENT MONTHS are the one obstacle in the path of southern forestry advance. Southern guests at the Union Bag conference said that industry, state and federal holdings are already hurting from widespread losses. A continuation of the present trend might well have disastrous results. In view of the fact that the very economic future of the South is at stake here, there were those at the conference who favored a "big stick" policy as regards penalties for incendiaries and people who are careless in the woods. At the same time it was agreed there is no substitute for a literate, informed public—on which all enforcement efforts must depend in the final analysis. Educational efforts must not only be stepped up—they must also be dramatized more effectively, it was agreed. Training programs both in fire prevention and control were recommended as well as mass meetings. Research on how to move big equipment freely on soft or swampy forest land and how to combat the accidental fire was strongly recommended. No one line of attack will solve the problem most of the guests seemed to think. All possibilities, including stricter punishment for incendiaries, must be utilized—which clearly shows the importance of the best coordination possible in the whole forestry field. Get-togethers like the one at Savannah presented one fine tool for the achievement of effective coordination, one Forest Service man added.

FURNITURE, VENEER AND PLYWOOD MANUFACTURERS IN THE PIEDMONT region of North Carolina, working with the North Carolina Forestry Association, Forest Service, forestry schools and Duke Power Company, have reached over into the pulp and paper field and tagged a forester by the name of Howard J. Doyle. Previously with the Southern Pulpwood Conservation Association, Mr. Doyle will attempt to do the same thing for southern hardwoods the SPCA, research stations and other

(Turn to next page)

groups have done for pines. That is to show small woodland owners how hardwoods can be grown faster and better and how markets can be provided for them. A research program to be headed by a scientist to be appointed by the Forest Service will spearhead this pioneer effort. Mr. Doyle will conduct forestry demonstrations for landowners and acquaint the public with what is going on in addition to doing some work in research. AMERICAN FORESTS will present a full length article on this striking new development, the first full-fledged cooperative effort in the hardwood field, in a future issue. Meanwhile, hardwood manufacturers are advising pulpwood growers they had better look to their laurels. The furniture manufacturers are in business, in North Carolina, to stay.

"NOW WE'RE GETTING SOMEWHERE," JOHN C. FOX, EDITOR of the Mining Congress Journal commented in the May issue of that publication in endorsing proposals now pending in Congress that will clear up mining law abuses on public lands that have plagued land administrators for more than two decades. Apparently Mr. Fox is right. Following hearings on Rep. Rogers' Bill (HR 5891) on May 20 that would permit a more workable form of multiple use management on valid claims while enabling officials to quickly "wash out" those that are invalid, the Mines and Mining Subcommittee reported the bill favorably to the full House Interior and Insular Affairs Committee on the same day. The bill carries amendments recommended by Interior that would give O. & C. lands the same status as other public lands under the act. Quick approval by the House committee was being predicted in May but the status of S. 1713, Senator Anderson's companion bill in the Senate, was somewhat less certain. While a majority of members on the committee appeared to favor the measure there were indications that Senator Malone, a committee member, was not in sympathy with any move to amend the mining laws. Prospect that Senator Milliken might propose an amendment whereby claimants would be provided timber to work their claims in the event federal officials removed the timber on their claims (as would be permitted under the bill) could create a roadblock in the path of progress.

WITH ONE EXCEPTION, TESTIMONY ON THE MEASURES AT BOTH HEARINGS were favorable with representatives of conservation, the wood industries, mining and the Agriculture and Interior Departments presenting a united front. Gratified by the support given the proposed bills, Forest Service Chief R. E. McArdle stressed that the problem of preventing misuse of mining claims on national forests "is the most important single problem facing the Forest Service." Raymond N. Holbrook, chairman of the Public Lands Committee of the American Mining Congress, called the bills "constructive." William D. Hagenstein, of the Industrial Forestry Association, cited three specific case histories on western public lands where misuse of claims had impeded land management. Lowell Besley, whose initial conference in February started the wheels turning, pledged AFA's support to the proposals. Other conservation organizations supporting the measures at hearings included Charles H. Callison, National Wildlife Federation; C. R. Gutermuth, Wildlife Management Institute; and Michael Hudoba, Washington representative of Sports Afield, representing the Izaak Walton League and the National Parks Association. On the other side of the fence, Robert S. Palmer, secretary of the Colorado Mining Association, was not in sympathy with certain portions of the proposed bills.

"MISSION 66" is the title of a completely-new 10-year plan for the national parks that will be submitted to Congress next year by Director Conrad L. Wirth and which will tie in the 50th anniversary of the national parks system in 1966. This program will be a complete new look at the whole national parks system and pressing problems in various parks that have received widespread publicity in recent months. A special staff is at work on the new plan under Mr. Wirth's direction. Possibility of removing hotels and motels in some parks to adjacent national forests is being given consideration. It is probable that no more hotels will be built in the parks. Meanwhile, the National Parks Association has announced that it may sponsor a National Parks Conference at either Yosemite National Park or Jackson Hole next spring.

THE PRELIMINARY DRAFT OF THE TIMBER RESOURCES REVIEW of the U.S. Forest Service will be submitted to the National Advisory Council around September 1, according to latest estimates. A large number of organizations and individuals in addition to the Council will be invited to make their own analyses of the report and to submit suggestions or recommendations to the Service.

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SEE PAGE 60

North Carolina

(*From page* 17)

and laurel are at their peak in June.

Most fabulous aspect of this "real gone" tourist state, as the hepsters would say, is the Blue Ridge Parkway, which stretches some 477 miles to link the Great Smoky Mountains National Park with the Shenandoah National Park in Virginia.

It's a fact that this is unlike any other motor road in the world. Soaring over a mile-high in places and burrowing through tunnels in others, it affords views that are ever-changing with the seasons.

Another thing, remember the poem, "I think that I shall never see, a poem lovely as a tree . . . in fact, unless the billboards fall, I'll probably never see a tree at all"? Well, the Park Service commendably forbids commercial vehicles and advertising signs on the Parkway, which is, of course, open all spring, summer and autumn.

But what's your order, Mister?

Forests?—there are four national forests in North Carolina, ranging from the huge Nantahala National Forest (1,349,000 acres) to the picturesque Joyce Kilmer Memorial Forest, a mere 3840 acres.

Parks? There is one national park and thirteen state maintained parks. Greatest of these is the 461.-000-acre Great Smoky Mountains National Park which includes Clingman's Dome (6,642 feet), reached by the highest highway in the East.

Mountain hiking? — Appalachian Trail, to give you just an example, is the longest hiking trail in America, extending along the crest of the Appalachians from Mt. Katahdin in Maine to northern Georgia. And about 200 miles of this goes through North Carolina.

Swimming?—

To go into detail on swimming and the other outdoor water sports such as fishing and boating would take an article in itself. But a perfect example is the outer banks where long isolated Hatteras has a new state highway and bus service.

Hatteras Island, tempered by the Gulf Stream that flows close to the quicksand cape, is so mild that oranges grow in the winter and summer temperatures range ten degrees below those in the mainland.

So, if it's variety you're hunting —and who isn't these days—North Carolina should be your number one stopping place.

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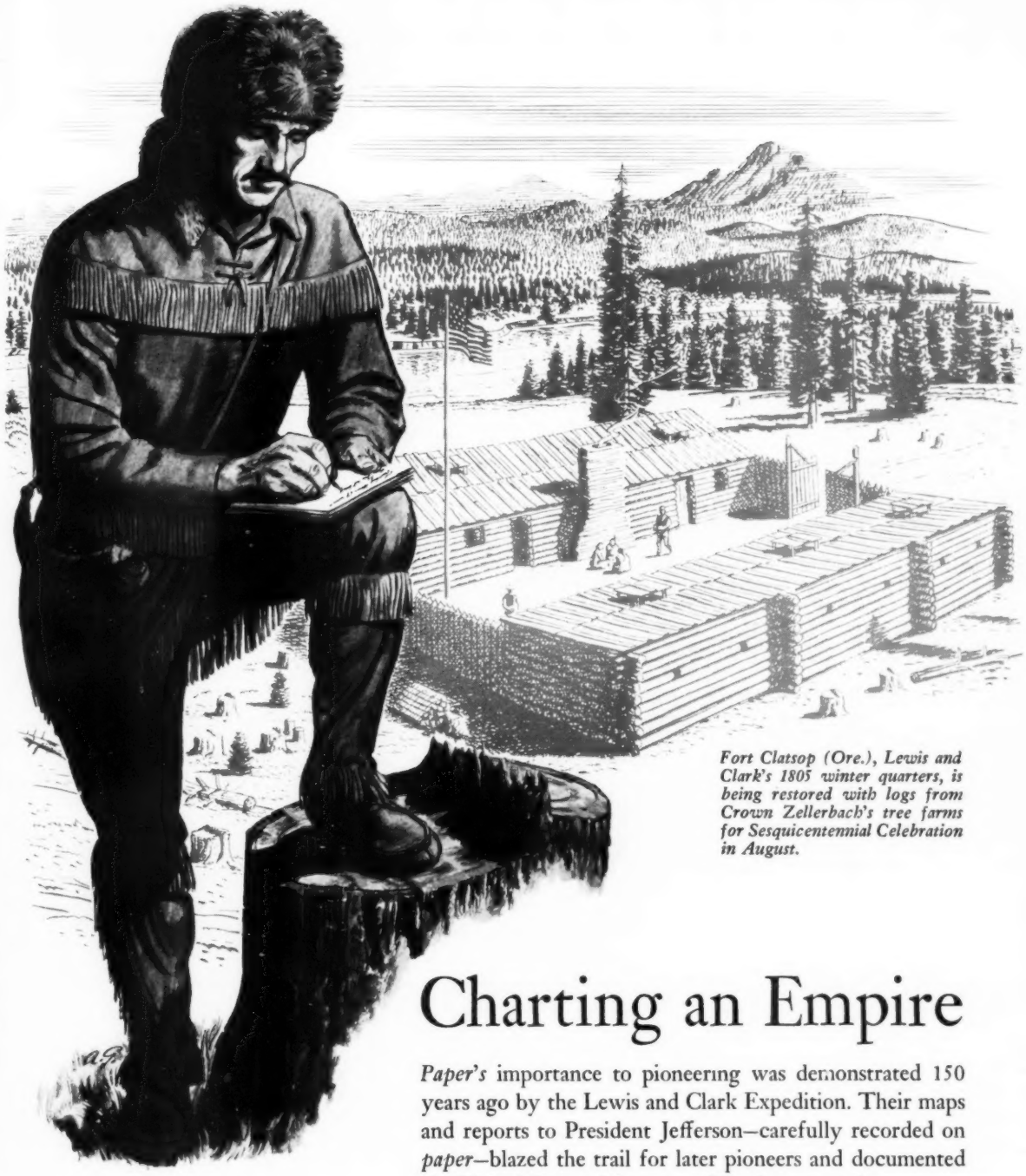
Feature Photo of the Month

Photos used on this page will be of unusual rather than esthetic qualities and subject matter will be restricted to scenes, events, objects or persons related to the use, enjoyment or unique aspects of our renewable natural resources For each picture selected AMERICAN FORESTS *will pay $10*

Photo submitted by J. G. Moore

This tree may be suffering from a split personality, but that doesn't detract from its arresting appearance. It's located near Sedona, Ariz.



Fort Clatsop (Ore.), Lewis and Clark's 1805 winter quarters, is being restored with logs from Crown Zellerbach's tree farms for Sesquicentennial Celebration in August.

Charting an Empire

Paper's importance to pioneering was demonstrated 150 years ago by the Lewis and Clark Expedition. Their maps and reports to President Jefferson—carefully recorded on *paper*—blazed the trail for later pioneers and documented the United States claim to our Northwest empire.

Today's pioneers also depend on *paper*—for it is essential to charting new trails in science and education, in industry and government. Crown Zellerbach is managing forests discovered by Lewis and Clark to assure modern pioneers a perpetual supply of *paper* for every use.

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THIS CAT* D6 Tractor with No. 6A Bulldozer is one of a fleet of rugged yellow units used by Brunswick Pulp and Paper Co., Brunswick, Ga. Here the D6 is clearing right-of-way on a logging road construction job on the company's South Diamond Tract in Brantley County. C. M. Hatcher, foreman, sums up his experience with Caterpillar-built equipment this way: "For general all-around work, a Cat-built rig can't be beat. It's the best made. Service can't be beat, either. When we call on our machines, they're always ready to go."

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